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Natural Resource Issues Interpretation in the National Park Service

A Report from the Natural Resource Strategic Plan Natural Resource Interpretation Committee

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Department of the Interior
National Park Service

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July 1994

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Natural Resource Issues Interpretation in the National Park Service

Executive Summary

The Natural Resources Interpretation Committee (NRIC) was formed to carry out three actions identified in *A Strategic Plan for Improving the Natural Resources Program of the National Park Service*: (1) make recommendations regarding changes in the substance, support, and administration of the natural resource interpretation programs; (2) develop a traveling natural resource exhibit for professional society meetings; and (3) conduct a continuing evaluation of natural resource interpretive programs. This report covers the first two actions.

The committee, composed of ten National Park Service natural resource management and interpretation staff members, met three times in 1992 and 1993 to discuss the issues and decide on methods. The traveling natural resource exhibit was completed in July 1993. A questionnaire on natural resource issues interpretation was developed and sent to 251 parks. Responses were received from 203 parks (approximately 80%). This report is based on results from the questionnaire, experience of the committee members, and reviews of the report from the field.

Findings

Comparison of the NRIC survey results with a survey of interpretation of natural resource management in the National Park Service conducted in 1983 by Richard Cunningham, Chief of Interpretation, Western Region, shows that natural resource interpretation has greatly expanded in the past 10 years, but that more is needed. The desire to increase natural resource issues interpretation is widespread in the Service. The chief obstacles are inadequate funding and staff; lack of commitment by some park managers; insufficient training, education, and professionalization; limited access to information; and underdeveloped use of partnerships. The committee makes the following recommendations for addressing these problems.

Recommendations

Funding and Staffing

1. Increase the FTEs and funding for park interpretive programs. Begin or enhance resource issue focused programs in park, regional, and central offices.

2. Encourage inclusion of funding for an interpretive component in all appropriate natural resource management projects and programs.

3. Encourage park managers to develop grants through the National Park Foundation and other organizations or agencies to fund interpretation of natural resource issue projects. Use existing funding sources to seek matching funds from other organizations.

4. Utilize the cyclic maintenance and repair/rehabilitation programs to improve interpretive media in parks.

5. Earmark a percentage of user fees for resource issue interpretation.

6. Include fund-raising for interpretation of resource issues as one activity of "Friends of the Park" groups.

Management Commitment

7. Develop Servicewide policy support for natural resource interpretation.

8. Implement a "team management" approach in parks, including interpretive personnel as an integral part of most park operations; in particular, resource management and research.

9. Incorporate resource issue interpretive statements into National Park Service guidelines.

10. Establish planning document support for resource issue interpretation (i.e., interpretive statement in resource management plan project statements, GMPs, and interpretive prospectuses).

11. Include in the park's statement for management a list of issues identified as the most misunderstood and most likely to adversely affect park management.

12. Include criteria for resource issue interpretation in operations evaluation guidelines.

13. Develop a method to evaluate the effectiveness of natural resource issue interpretive programs in relation to the goals of each program.

Professionalization and Training

14. Support the Career Committee of the Vail Agenda and the Ranger Futures Working Group in cooperation with the Office of Personnel Management in redefining standards in the GS-025 series.

15. Identify interpretive positions that require professional level performance and classify them appropriately.

16. Establish a requirement to maintain professional standing through in-service training and university courses.

17. Encourage attendance and participation in professional society seminars.

18. Establish a series of critical resource issue workshops as Servicewide employee development courses.

19. Promote recruitment of natural resource interpreters at appropriate institutions of higher learning, including historically minority colleges and universities.

20. Develop theme-related cooperative park education units (CPEUs) as a complement to cooperative park study units (CPSUs) in the National Biological Survey.

21. Develop an "Interpretation for Managers" course designed to introduce superintendents to "cutting edge" resource management interpretation and the use of interpretation as an effective management tool.

22. Provide seasonal employees with sufficient training to perform at a proficient level. Training should be on-going and the quality of information disseminated by each seasonal should be monitored throughout the employment period.

Information Availability and Transfer

23. Park interpreters should consult with resource managers to identify informational needs for natural resource interpretive programs.

24. Existing National Park Service natural resource databases (e.g., Resources Management Plan Database, inventory and monitoring databases, Investigators' Annual Report Database) should be publicized, improved, and made more accessible to interpreters.

25. Identify and provide access to existing annotated, computerized bibliographies on natural resource management topics.

26. Enhance or establish park libraries and information management standards to facilitate interpretation and resource management information sharing.

27. Require non-technical summaries of all research and resource management projects in parks, in reports, and in presentations to park staffs.

28. Establish liaison positions in the divisions of interpretation and resource management to formalize and facilitate information transfer.

29. Where appropriate, assign public information officer duties to the division of interpretation to ensure consistent communication of natural resource management issues.

30. Design or use existing information exchange systems, such as bulletin boards, interactive computers, site bulletins, and newspapers, to communicate natural resource management issues and programs within individual parks and throughout the National Park System.

31. Develop audiovisual media support for resource management interpretation, particularly videotaping capabilities, conversion of slide libraries to a standardized digital format, and automated databases for accessing visual imagery.

Partnerships

32. Pursue opportunities for alternative funding sources.

33. Cultivate innovative means of sharing information, such as tours, field days, conferences, and seminars.

34. Be pro-active in using the media to convey resource management information.

35. Expand partnerships in stewardship activities, such as restoration projects and clean-up ventures.

36. Train National Park Service staffs in skills needed for developing effective partnerships.

37. Expand partnerships through ecosystem management initiatives among National Park Service units, with neighboring land managers, and with broader publics.

Natural Resource Issues Interpretation in the National Park Service

"Close communication between those who work in research, resource management, and interpretation is essential to the success of the National Park Service science program because it is through interpretation that the knowledge gained through science is conveyed to decision makers and ultimately, to the owners of the park system--the public."

Science and the National Parks, National Research Council, 1992.

The National Park Service was created to preserve and protect the nation's outstanding cultural and natural resources for the enjoyment of the people of the United States, both now and into the future. As the population in this country grows, meeting the goals of both protection and enjoyment becomes more and more difficult. While the Park Service is currently coming up with innovative and creative ways to address these challenges, we have under-utilized one very powerful tool. That tool is the public itself, the source of many of our problems and, possibly, many of the solutions. From their actions while visiting parks to their votes on issues affecting parks, the public generates a powerful and persuasive base that can be either beneficial or detrimental to natural and cultural resources.

Through education, we can create in the public our strongest allies. The visitor who knows the fragility of tundra will stay on the designated trails. The visitor who understands the purpose of prescribed fires will see their necessity in certain situations. The visitor who learns that air pollution is destroying the view from a National Park Service area will support the protection of these vistas.

To create an educated and supportive constituency, we have to tell the public about issues affecting natural and cultural resources. We have to help them to understand the fragility of our resources. We have to explain that however controversial they seem, resource management decisions are based on sound research and are designed to protect resources now and into the future.

Without question, the National Park Services's unmatched interpretive infrastructure provides the best way to disseminate this information to the public and inform visitors about the extent and nature of the issues facing the National Park Service. Through exhibits, publications, and, especially, personal services, NPS interpreters reach millions of people

every year. Resource management should be an integral part of the interpretive function of every park with significant natural resources. Interpretation should always be considered in resource management plans, and resource management should always be considered in interpretive planning. Interpretation should be a component of all park resource projects and programs, including inclusion in general management plans, statements for management, and resource management plans. All programs, including interpretation, should be tied to resource protection and management.

The Natural Resources Interpretation Committee was formed to study these issues and develop recommendations that will direct the effort to integrate resource management and interpretation. One of nine interdisciplinary teams established in 1992 to implement *A Strategic Plan for Improving the Natural Resources Program of the National Park Service*, the primary purpose of this committee was to address how to promote better understanding of and support for the National Park Service natural resource management and research program through interpretation. Specifically, the committee was to make recommendations for strengthening interpretive programs on natural resource issues and to develop a traveling natural resource exhibit for professional society meetings. The final recommendations and report relate to those of both the Natural Resources Strategic Plan and the Vail Agenda (*National Parks for the 21st Century*).

The committee first met on October 20, 1992, to discuss products and to develop a strategy for completing each product. With the assistance of the Harpers Ferry Center exhibits divisions, the travelling exhibit was completed in July 1993. The exhibit informs researchers about National Park Service research needs, opportunities, administrative procedures, and commitment. It is available for use from the Wildlife and Vegetation Division, Washington Office.

In order to make recommendations for changes in the substance, support, and administration of natural resource interpretation programs, the committee decided to obtain input from park personnel concerning the extent of natural resource issue interpretation programs currently being provided Servicewide, and any problems associated with these programs. A questionnaire was sent to 251 parks with significant natural resources; 203 responses (80%) were returned. (See Appendix A for a sample questionnaire.) This report discusses the findings of the questionnaire and delineates recommendations based on these findings and the combined expertise of the committee.

Findings

Questionnaire results

In order to examine the status, extent, problems, and concerns of natural resource issue interpretation in the National Park Service, the committee sent a questionnaire to selected units. The questionnaire included questions about natural resource issues that might affect the parks; whether or not the issues are interpreted; partnerships that helped the interpretive staff provide information to the public; and obstructions to issue-oriented interpretation. The questionnaire also included two open-ended questions that provided an opportunity to openly discuss measures needed to improve natural resource issue interpretation. The information gathered from the questionnaire does not, nor was it intended to, determine the *quality* of natural resource issue interpretive programs. Also, it should be noted that each response reflects, in most cases, the perspective of only one or two people. (See Appendix F for a sample of the questionnaire.)

Methods

The 251 park units determined by the Servicewide Inventory and Monitoring Program to contain significant natural resources received the questionnaire; this provided an effective screen for units with significant natural resources. The committee sent questionnaire to each of the ten National Park Service regional offices for distribution during the spring of 1993. Each regional office sent the questionnaire to park chiefs of interpretation, who were given approximately 4-6 weeks to respond. The completed questionnaires were sent to the committee chairman. Approximately 80%, or 203, of the questionnaires were returned, reviewed, and sent to the University of Washington, Cooperative Park Studies Unit, for data analysis. The analysis was completed in January 1994.

Questions 1-6 asked about the variety of natural resource issues affecting the park, regardless of whether the effects were positive or negative. This set of questions also provided the committee with information on the number of parks interpreting the issue and how the issue was interpreted. Six natural resource issue categories (water, air, faunal, floral, land use, and other) comprised the first six questions. The issues selected for all the questions represented those affecting many National Park Service areas and were not intended to be comprehensive. Nor were the six questions intended or designed to provide a quantitative analysis of issues affecting the National Park Service. Rather, the main focus was to determine if an issue was being interpreted when the interpretive staff perceived it as affecting park resources. Other natural resource issues identified by respondents are listed in Appendix B.

Question 7 was developed to identify the park partnerships that assist in the interpretation of natural resource issues. The respondents were asked to rate their involvement with several listed partnerships and to identify other partnerships. Other partnerships identified by respondents are listed in Appendix C.

Question 8 asked whether the park has or is planning to develop a natural resource issue school-based curriculum for use at nearby primary and secondary schools.

Question 9 identified possible impediments to the interpretation of natural resource issues. The respondents were asked to score the significance of the listed obstructions. They also had an opportunity to list additional obstructions. (See Appendix D.)

Questions 10 and 11 were open ended questions that allowed respondents to express their views on what measures should be taken to improve the interpretation of natural resource issues Servicewide. All responses to these two questions are reproduced in Appendix E.

Summary of Questionnaire Results

Tables 1 through 6 show that personal services, including staff-guided walks and talks, are consistently the most commonly used media for interpretation of natural resource issues. Publications tended to be the second most popular medium, followed by exhibits. Audiovisual programs were consistently the least often used medium. The pattern of using different media may reflect the nature of the issue interpreted. Personal services are easily modified on a daily basis in response to changing conditions, an important consideration when dealing with controversial or evolving issues. Some publications, such as site bulletins, also offer relatively quick response, while exhibits and audiovisual programs take a long time to develop and are usually designed to remain basically unchanged for several years. There is also a considerable amount of review for exhibits and programs, so particularly complex or controversial issues are likely to be left out in favor of simpler and safer messages.

The results of questions 1-6 show that the majority of parks affected by an issue are providing information to the public through interpretive programs. In total, 3,613 issues (types of issues x number of parks with the issues) affecting National Park Service areas were identified, and 2,700 (75%) of the issues were being interpreted. Only two types of issues were interpreted by fewer than 50% of the parks affected. This says little about extent or effectiveness of interpretation efforts, only that parks were doing some level of interpretation.

Issues that are notably low in the percentage of parks interpreting them are: acid deposition, legal hunting and fishing, vandalism (plants), illegal camping and fires, erosion and deposition, waste management and recycling, and off-road vehicle use. ***Acid deposition*** may be viewed as an issue of external origin and a non-traditional topic for interpretation. The other issues identified may be viewed as more of a protection responsibility than a function for interpretation.

Publications were most often used to interpret human and wildlife interactions, threatened and endangered species (animals), threatened and endangered species (plants), legal hunting and fishing, illegal camping and fires, fire management, and off-road vehicle use issues. Publications are least often used to interpret issues such as ***noise*** and ***livestock grazing***.

Water Resource Issues

Loss of wetlands and other aquatic habitats was the issue most frequently interpreted by affected parks. (See Table 1.) The percentage of parks (57%) interpreting ***impacts to water quantity and water rights*** was substantially less than any of the other interpreted water resource issues. Differences may be attributable to the relative ease of recognizing some instances of habitat loss and conveying that to the public, in contrast with the difficulty of understanding and quickly conveying water rights issues. The gathering and analysis of water flow data also tend to be weak in many parks, so the basic information may not be available to support interpretation of this issue.

Table 1
Interpretation of Water Resources Issues

Water Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Loss of wetlands and other aquatic habitats	80% (62/78)	Exhibits Publications Pers. Services A/V Programs	19 (31%) 31 (50%) 56 (90%) 14 (23%)	78 (38%)
Flood hazards	75% (63/84)	Exhibits Publications Per. Services A/V Programs	18 (29%) 30 (48%) 54 (86%) 10 (16%)	84 (41%)
Impacts to water quality	71% (100/141)	Exhibits Publications Per. Services A/V Programs	25 (25%) 45 (45%) 88 (88%) 10 (10%)	141 (69%)
Impacts to water quantity and water rights	57% (53/93)	Exhibits Publications Per. Services A/V Programs	11 (21%) 24 (45%) 48 (91%) 7 (13%)	93 (46%)
Other resource issues[2]	78% (39/50)	Exhibits Publications Per. Services A/V Programs	13 (33%) 18 (46%) 38 (97%) 7 (18%)	50 (25%)

[1] Exhibits include wayside and museum exhibits.
Publications include publications for sale and free publications such as site bulletins and park newspapers.
Personal Services include staff guided walks and talks.
A/V Programs include films, slide programs, and audio and video tapes.

[2] Other resource issues identified by respondents are listed in Appendix B.

Air Resource Issues

Respondents reported more use of exhibits for the interpretation of ***visibility*** and ***vegetation injury*** issues than for any other air resource issue. (See Table 2.) This is probably the result of the Air Quality Division's assistance with the design and funding of park exhibits. The greater use of exhibits does not seem to diminish the use of personal services.

Air quality issues were least often reported as affecting parks or being interpreted. This may be because some park staffs view air resource issues as difficult subjects to address. Air pollution often originates outside the parks, sometimes at great distances, and involves difficult concepts like long-range transport and transformation of air pollutants in the atmosphere. Also, interpreters may not be aware of the assistance and information available from the resource management staff at the park and/or the National Park Service Air Quality Division for the development of air quality awareness programs and exhibits.

With the exception of ***damage to cultural resources***, there is little reported use of audiovisual programs to interpret air resource issues.

(Table 2, Interpretation of Air Resource Issues, follows on next page.)

Table 2
Interpretation of Air Resource Issues

Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Visibility	72% (72/100)	Exhibits Publications Per. Services A/V Programs	35 (49%) 21 (29%) 64 (89%) 6 (8%)	100 (49%)
Damage to cultural resources	58% (41/71)	Exhibits Publications Per. Services A/V Programs	15 (37%) 14 (34%) 37 (90%) 8 (20%)	71 (35%)
Vegetation injury	62% (43/69)	Exhibits Publications Per. Services A/V Programs	21 (49%) 14 (32%) 38 (88%) 3 (7%)	69 (34%)
Acid deposition	61% (39/62)	Exhibits Publications Per. Services A/V Programs	15 (38%) 17 (44%) 31 (79%) 2 (5%)	62 (32%)
Human health	64% (27/42)	Exhibits Publications Per. Services A/V Programs	8 (30%) 6 (22%) 24 (89%) 1 (4%)	42 (21%)
Other resource issues[2]	69% (11/16)	Exhibits Publications Per. Services A/V Programs	1 (9%) 2 (18%) 11 (100%) 0	16 (8%)

[1] Exhibits include wayside and museum exhibits.
Publications include publications for sale and free publications such as site bulletins and park newspapers.
Personal Services include staff guided walks and talks.
A/V Programs include films, slide programs, and audio and video tapes.

[2] Other resource issues identified by respondents are listed in Appendix B.

Fauna and Flora Resource Issues

A high percentage of the parks are interpreting two issues, ***threatened and endangered species*** and ***habitat restoration or loss***, for both fauna and flora. (See Table 3 and 4.) Illegal ***collection of plants*** was reported to be interpreted by a relatively high percentage (75%) of parks, while the illegal ***poaching of animals*** was interpreted by only 59% of the respondents.

Among issues related to fauna, ***exotic species***, ***poaching***, and ***pest management*** are, as a group, less often interpreted than other issues. Interpretation of floral issues shows a more even distribution, with only the least-interpreted issue, ***pest management***, falling well below the others.

When an issue affects park fauna it is more often interpreted than similar issues affecting park flora. This may represent a greater knowledge of wildlife issues among park staffs, or a perception that wildlife is more charismatic than plants and therefore more conducive to interesting interpretive presentations.

(Tables 3 and 4, Interpretation of Faunal and Floral Resource Issues, follow.)

Table 3 Interpretation of Faunal Resource Issues

Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Human and wildlife interactions	91% (127/140)	Exhibits Publications Per. Services A/V Programs	49 (39%) 82 (65%) 107 (84%) 27 (21%)	140 (69%)
Threatened and endangered species	86% (109/127)	Exhibits Publications Per. Services A/V Programs	41 (38%) 72 (66%) 95 (87%) 27 (25%)	127 (63%)
Legal hunting and fishing	86% (80/93)	Exhibits Publications Per. Services A/V Programs	17 (21%) 58 (72%) 61 (76%) 10 (12%)	93 (46%)
Species reintroduction	82% (50/61)	Exhibits Publications Per. Services A/V Programs	11 (22%) 25 (50%) 44 (88%) 11 (22%)	61 (30%)
Habitat restoration or loss	81% (82/101)	Exhibits Publications Per. Services A/V Programs	28 (34%) 40 (49%) 75 (91%) 15 (18%)	101 (50%)
Exotic species	68% (75/111)	Exhibits Publications Per. Services A/V Programs	21 (28%) 39 (52%) 64 (85%) 7 (9%)	111 (55%)
Poaching	59% (59/100)	Exhibits Publications Per. Services A/V Programs	8 (14%) 25 (42%) 49 (83%) 4 (7%)	100 (49%)
Pest management	50% (50/103)	Exhibits Publications Per. Services A/V Programs	9 (18%) 23 (45%) 44 (86%) 1 (2%)	103 (51%)
Other resource issues[2]	81% (17/21)	Exhibits Publications Per. Services A/V Programs	4 (24%) 8 (47%) 16 (94%) 2 (12%)	21 (10%)

[1] Exhibits include wayside and museum exhibits.
Publications include publications for sale and free publications such as site bulletins and park newspapers.
Personal Services include staff guided walks and talks.
A/V Programs include films, slide programs, and audio and video tapes.

[2] Other resource issues identified by respondents are listed in Appendix B.

Table 4
Interpretation of Floral Resource Issues

Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Threatened and endangered species	89% (97/109)	Exhibits Publications Per. Services A/V Programs	22 (23%) 54 (56%) 79 (81%) 11 (11%)	109 (54%)
Vandalism	78% (46/59)	Exhibits Publications Per. Services A/V Programs	12 (26%) 22 (48%) 35 (76%) 2 (4%)	59 (29%)
Habitat restoration or loss	75% (83/111)	Exhibits Publications Per. Services A/V Programs	31 (37%) 39 (47%) 74 (89%) 14 (17%)	111 (55%)
Collection of plants	75% (73/97)	Exhibits Publications Per. Services A/V Programs	12 (16%) 43 (59%) 64 (88%) 1 (1%)	97 (48%)
Species reintroduction	67% (34/51)	Exhibits Publications Per. Services A/V Programs	8 (24%) 13 (38%) 28 (82%) 3 (9%)	51 (25%)
Exotic species	66% (95/143)	Exhibits Publications Per. Services A/V Programs	21 (22%) 50 (53%) 90 (95%) 5 (5%)	143 (70%)
Pest management	52% (46/89)	Exhibits Publications Per. Services A/V Programs	4 (9%) 23 (50%) 41 (89%) 1 (2%)	89 (44%)
Other resource issues[2]	71% (15/21)	Exhibits Publications Per. Services A/V Programs	5 (33%) 7 (47%) 13 (87%) 2 (13%)	21 (10%)

[1] Exhibits include wayside and museum exhibits.
Publications include publications for sale and free publications such as site bulletins and park newspapers.
Personal Services include staff guided walks and talks.
A/V Programs include films, slide programs, and audio and video tapes.

[2] Other resource issues identified by respondents are listed in Appendix B.

Land Resource Issues

Land use issues are generally less likely to be interpreted than any of the other groups except air resources. ***Tourism/recreation activities*** is the only land use issue that stands above the overall mean. (See Table 5.) Several of the land use issues affect only a few National Park Service units; therefore the knowledge and institutional support may not be as well developed as for some of the more widespread issues. The issues of ***mining, livestock grazing, timber harvest,*** and ***oil and gas*** require specialized expertise in both the resource management and interpretation staffs to understand and interpret them. The low level of interpretation may also be attributed to the contentious and controversial nature of many land use issues. ***Development adjacent to park border*** is recognized as a difficult issue, and while it affects 70% of the surveyed units, it is interpreted at only 60% of these.

(Table 5, Interpretation of Land Resource Issues, follows on next page.)

Table 5 Interpretation of Land Resource Issues

Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Tourism/recreation activities	85% (129/152)	Exhibits Publications Per. Services A/V Programs	28 (22%) 79 (61%) 105 (81%) 20 (16%)	152 (75%)
Mining	72% (33/46)	Exhibits Publications Per. Services A/V Programs	11 (33%) 12 (36%) 30 (91%) 1 (3%)	46 (23%)
Agriculture	72% (29/40)	Exhibits Publications Per. Services A/V Programs	3 (10%) 13 (45%) 24 (83%) 4 (14%)	40 (20%)
Livestock grazing	64% (42/66)	Exhibits Publications Per. Services A/V Programs	6 (14%) 10 (24%) 39 (93%) 2 (5%)	66 (33%)
Development adjacent to park border	60% (86/143)	Exhibits Publications Per. Services A/V Programs	8 (9%) 25 (29%) 78 (91%) 9 (10%)	143 (70%)
Timber harvest	59% (20/34)	Exhibits Publications Per. Services A/V Programs	2 (1%) 9 (45%) 18 (90%) 1 (5%)	34 (17%)
Oil and gas	51% (19/37)	Exhibits Publications Per. Services A/V Programs	7 (37%) 8 (42%) 17 (89%) 3 (16%)	37 (18%)
Inholdings	49% (33/68)	Exhibits Publications Per. Services A/V Programs	4 (12%) 13 (39%) 29 (88%) 1 (3%)	68 (33%)
Other resource issues[2]	52% (11/21)	Exhibits Publications Per. Services A/V Programs	2 (18%) 5 (45%) 11 (100%) 2 (18%)	21 (10%)

[1] Exhibits include wayside and museum exhibits.
Publications include publications for sale and free publications such as site bulletins and park newspapers.
Personal Services include staff guided walks and talks.
A/V Programs include films, slide programs, and audio and video tapes.

[2] Other resource issues identified by respondents are listed in Appendix B.

Other Resource Issues

These other issues fall into three groups. Four issues--***visitor damage to natural resources, biodiversity, illegal camping and fires,*** and ***erosion and deposition***--were interpreted by over 80% of affected units. (See Table 6.) The other issues fell below 80% and ***noise*** was much lower at 46%.

Biodiversity and ***ecosystem management*** are issues with some of the highest use of audiovisual programs.

Forty-five percent of the surveyed units identified ***noise*** (from aircraft and vehicles) as an issue, but only 46% of those units were interpreting it, the lowest of any of the identified issues. This may be a reflection of the national approach to noise pollution and natural quiet. While many park visitors identify quiet and solitude as important parts of their park visit, national efforts to control noise pollution have focused primarily on the health effects of loud noise, not the preservation or restoration of silence. It may be difficult to establish a management position or an interpretive program when noise standards are not clearly defined for National Park Service units. These are the very situations where interpretation is an essential tool for educating the public and policy makers about an issue so park resources and visitor experiences will not be damaged.

Table 6
Interpretation of Other Resource Issues

Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Visitor damage to natural resources	88% (113/129)	Exhibits Publications Per. Services A/V Programs	40 (35%) 71 (63%) 102 (90%) 15 (13%)	129 (64%)
Biodiversity	88% (100/114)	Exhibits Publications Per. Services A/V Programs	26 (26%) 52 (52%) 93 (93%) 23 (23%)	114 (56%)
Illegal camping and fires	88% (77/88)	Exhibits Publications Per. Services A/V Programs	17 (22%) 56 (73%) 61 (79%) 5 (6%)	88 (43%)
Erosion and deposition	83% (86/103)	Exhibits Publications Per. Services A/V Programs	22 (26%) 35 (41%) 61 (71%) 16 (19%)	103 (51%)

Continued on next page.

Resource Issues	Percent of Units Interpreting Issue (units interpreting/units affected)	How Issue is Interpreted[1]		Units Affected by Issue (% of Respondents, N=203)
Visitor damage to natural resources	88% (113/129)	Exhibits Publications Per. Services A/V Programs	40 (35%) 71 (63%) 102 (90%) 15 (13%)	129 (64%)
Global climate change	76% (48/63)	Exhibits Publications Per. Services A/V Programs	4 (8%) 21 (44%) 46 (96%) 6 (12%)	63 (31%)
Fire management	75% (73/97)	Exhibits Publications Per. Services A/V Programs	22 (30%) 46 (63%) 63 (86%) 12 (16%)	97 (48%)
Ecosystem management	75% (69/92)	Exhibits Publications Per. Services A/V Programs	16 (23%) 38 (55%) 66 (96%) 17 (25%)	92 (45%)
Waste management and/or recycling	71% (82/115)	Exhibits Publications Per. Services A/V Programs	27 (33%) 49 (60%) 56 (68%) 2 (2%)	115 (57%)
Off-road vehicle use	67% (52/78)	Exhibits Publications Per. Services A/V Programs	13 (25%) 35 (67%) 37 (71%) 5 (10%)	78 (38%)
Noise (aircraft,vehicular, etc)	46% (42/91)	Exhibits Publications Per. Services A/V Programs	1 (2%) 8 (19%) 40 (95%) 1 (2%)	91 (45%)
Other resource issues[2]	82% (18/22)	Exhibits Publications Per. Services A/V Programs	8 (44%) 13 (72%) 15 (83%) 3 (17%)	22 (11%)

[1] Exhibits include wayside and museum exhibits.
Publications include publications for sale and free publications such as site bulletins and park newspapers.
Personal Services include staff guided walks and talks.
A/V Programs include films, slide programs, and audio and video tapes.

[2] Other resource issues identified by respondents are listed in Appendix B.

Partnerships

Partnerships included in the questionnaire can be divided into two groups based on whether the partner is providing information to the park interpretive function or information dissemination to the public. Of those providing information to the interpretive staff, ***park resource managers*** were recognized as the most involved; ***park and independent researchers*** and ***educational institutions*** were also involved in more than 60% of the units. The 25% of parks reporting that they were not involved with ***park resource managers*** is a disturbingly large number.

Of the partnerships disseminating information to the public, ***VIPs and SCAs*** and ***cooperating associations*** were the most involved, while ***local civic groups*** and ***concessionaires*** were reported to have little involvement.

(Table 7, Partnerships, follows on next page.)

Table 7
Partnerships

Response to Question 7 on active partnerships. Partnerships are ranked by the percent of positive responses. Numbers of responses are indicated in parenthesis and percentages are calculated from a total of 203 questionnaires returned.

Partnership	Affirmative Response[1]	Level of Involvement[2] 3	2	1	NI	Response Rating[3]
VIPs and SCAs	77% (156)	35% (72)	26% (52)	16% (32)	23% (47)	1.73
Park resource managers	75% (153)	39% (79)	25% (50)	12% (24)	25% (50)	1.78
Cooperating associations	69% (141)	29% (58)	28% (56)	13% (27)	31% (62)	1.54
Park or independent researchers	66% (133)	18% (37)	27% (55)	20% (41)	34% (70)	1.29
Educational institutions	61% (124)	14% (28)	23% (47)	24% (49)	39% (79)	1.12
Local civic groups	40% (81)	4% (8)	13% (26)	23% (47)	60% (122)	0.61
"Friends of the Parks" groups	35% (72)	7% (15)	16% (32)	12% (25)	65% (131)	0.66
Concessionaires	29% (58)	2% (4)	8% (16)	19% (38)	71% (145)	0.4
Others[4]	11% (22)	6% (13)	3% (6)	1% (3)	89% (181)	0.27

[1] Affirmative responses are the sum of all responses that indicate some involvement (3,2, or 1).

[2] Responses are:
3 = Heavily Involved
2 = Somewhat Involved
1 = Slightly Involved
NI = Not Involved

[3] Response Rating is a weighted average of responses where 3.0 would indicate that all respondents were heavily involved and 0.0 would indicate no involvement.

[4] Other partnerships indicated by respondents are listed in Appendix C.

Most and Least Comparison of Partners

The following tables (Table 7A and 7B) compare the differences between a sub-sample of parks that reported interpreting the most (highest percentage of) issues that affected them, and a similar sub-sample of parks interpreting the fewest (lowest percentage of) issues. This comparison was made to examine the differences between parks that tend to do a comprehensive job, or are interpreting many issues, and those that have a very limited natural resource interpretation program. For the sake of discussion, these groups of parks are referred to as "most" and "least."

When observing the difference between the "most" and "least" parks, the "most" category of parks relied far more on partnerships than did the "least" category of parks.

All of the partnerships identified showed a higher response rating for degree of involvement among the "most" parks as compared with the "least." The sixth ranked partnership for the "most" parks (***local civic groups***) had nearly the same response rating (1.42) as the highest ranked partnership for the "least" parks (***cooperating associations***). The 2.57 rating of ***park resource managers*** for the "most" parks shows that in more than half of them interpreters were heavily involved with the resource managers.

(Tables 7A and 7B, Most and Least Comparison-Partnerships, follow.)

Table 7A Most and Least Comparison (Partnerships)

Comparison of responses to Question 7 between the 21 parks with the highest percentage of issues interpreted (among those affecting the park) and the 20 parks with the lowest percentage of issues interpreted.

Parks Interpreting Most Issues		Parks Interpreting Least Issues	
Affirmative Response[1]	**Partnership**	**Partnership**	**Affirmative Response**
100%	Park Resource Managers	Park or Independent Researchers	80%
100%	Educational Institutions	Cooperating Associations	75%
90%	VIPs and SCAs	VIPs and SCAs	75%
90%	Cooperating Associations	Park Resource Managers	70%
81%	Park and Independent Researchers	Educational Institutions	60%
76%	Local Civic Groups	Local Civic Groups	35%
71%	"Friends of the Parks" Groups	"Friends of the Parks" Groups	30%
62%	Concessionaires	Concessionaires	5%

[1] Affirmative responses are the sum of all responses that indicate some involvement (3,2, or 1).

Table 7B

Comparison of responses to Question 7 between the 21 parks with the highest percentage of issues interpreted (among those affecting the park) and the 20 parks with the lowest percentage of issues interpreted.

Parks Interpreting Most Issues		Parks Interpreting Least Issues	
Response Rating[1]	**Partnership**	**Partnership**	**Response Rating**
2.57	Park Resource Managers	Cooperating Associations	1.45
2.43	VIPs and SCAs	Park Resource Managers	1.40
2.10	Educational Institutions	Park or Independent Researchers	1.35
2.19	Cooperating Associations	VIPs and SCAs	1.35
1.76	Park and Independent Researchers	Educational Institutions	0.80
1.42	Local Civic Groups	"Friends of the Parks" Groups	0.60
1.33	"Friends of the Parks"	Local Civic Groups	0.50
0.86	Concessionaires	Concessionaires	0.10

[1] Response Rating is a weighted average of responses where 3.0 would indicate that all respondents were heavily involved and 0.0 would indicate no involvement.

School-based Curriculum

One hundred and thirty-two parks (65%) responded that they had or were planning to develop a school based curriculum that would in some degree address natural resource issues.

Table 8
Natural Resource Issues School-based Educational Curriculum

Response to Question 8 on school-based education curriculum. Number of responses that were affirmative or negative. The percentages are in parenthesis and are calculated from a total of 203 questionnaires returned.

	Affirmative Response	Negative Response
Natural resource issue school-based educational curriculum at park or planning to have one	132 (65%)	71 (35%)

Obstructions to Interpreting Natural Resource Issues

Inadequate staffing, funding, and ***facilities*** are clearly the most significant obstructions to issue-oriented interpretation cited by respondents. (See Table 9.) Two-thirds of responses reported that ***inadequate staffing*** and ***inadequate funding*** were either "Extremely Significant" or "Very Significant" obstructions. The high level of frustration over funding and staffing was probably predictable.

Other obstructions dropped one whole rating point below the top three, but some were still fairly significant. ***Lack of issue-oriented information*** ranked fourth as an obstruction with a rating of 2.15, and 61% of responses found it at least "Somewhat Significant." ***Lack of scientific background among interpretive staff*** and ***inadequate linkage to planning documents*** follow with similar levels of response and ratings. Though it was not included in this question, lack of issue-oriented training among interpreters was a frequent topic of responses to questions 10 and 11, and would probably have rated at least as high as the above three obstructions.

The remaining obstructions had low response ratings--less than 2.0--indicating that on average they were less than "Somewhat Significant." However, even among these low-rated obstructions, there were several responses that these were "Very Significant" or "Extremely Significant."

(Table 9, Obstructions to Interpreting Natural Resource Issues, follows on next page.)

Table 9 Obstructions to Interpreting Natural Resource Issues

Response to Question 9 on obstructions to interpretation. Obstructions are ranked by the percent of positive responses. Number of responses are in parenthesis and percentages are calculated from a total of 203 questionnaires returned.

Obstructions to Interpretation	Affirmative Response[1]	Level of Significance[2]					Response Rating[3]
		5	4	3	2	1	
Inadequate interpretation staffing	89% (181)	44% (89)	24% (48)	17% (35)	4% (9)	11% (22)	3.85
Inadequate interpretation funding	88% (179)	43% (87)	23% (47)	15% (30)	7% (15)	12% (24)	3.78
Inadequate interpretation facilities	77% (156)	28% (57)	20% (41)	18% (37)	10% (21)	23% (47)	3.19
Lack of issue-oriented information	61% (124)	6% (13)	9% (17)	18% (37)	28% (57)	39% (79)	2.15
Lack of scientific background among interpretive staff	61% (123)	3% (6)	12% (24)	19% (39)	27% (54)	39% (80)	2.12
Inadequate linkage to planning documents	57% (116)	4% (8)	12% (24)	20% (40)	22% (44)	43% (87)	2.12
Lack of visitor interest	51% (104)	4% (8)	8% (17)	11% (22)	28% (57)	49% (99)	1.91
Inadequate communication	44% (90)	3% (7)	7% (15)	9% (18)	25% (50)	56% (113)	1.78
Enabling legislation limits scope of interpretive topics	34% (68)	9% (18)	9% (19)	9% (19)	6% (12)	67% (135)	1.88
Lack of support by park and/or regional administration	33% (67)	7% (14)	7% (14)	7% (15)	12% (24)	67% (136)	1.75
National Park Service management policies and guidelines for interpretation are inadequate	25% (50)	2% (4)	3% (6)	7% (15)	12% (25)	75% (153)	1.44
Other[4]	14% (29)	9% (19)	4% (8)	1% (2)	0% (0)	86% (174)	1.51

[1] Affirmative responses are the sum of all responses that indicate some significance (5,4,3, or 2).

[2] Responses are:
- 5= Extremely Significant
- 4= Very Significant
- 3= Moderately Significant
- 2= Somewhat Significant
- 1= Not Significant

[3] Response Rating is a weighted average of responses where 5.0 would indicate that all respondents said the obstruction was extremely significant and 0.0 would indicate not significant.

[4] Other obstructions indicated by respondents are listed in Appendix D.

Most and Least Comparison between Obstructions

As in the similar comparison between "most" and "least" parks for question 7, almost every obstruction was found to be more of a problem by parks doing the "least" amount of natural resource issue interpretation. (See Tables 9A and 9B.) The single exception, in terms of significance ratings, was ***National Park Service Management Policies and guidelines are inadequate***. Possible explanations for this anomaly are that no actual difference exists beyond sampling error, or that parks doing very little issue interpretation have little need to consult National Park Service *Management Policies* or guidelines, so find fewer difficulties with them.

The three most prominent obstructions cited were the same as for the overall analysis of this question--***inadequate staffing, funding,*** and ***facilities***. These were more of a problem for parks doing the "least" issue interpretation than for those doing the "most." ***Lack of issue-oriented information*** showed the greatest increase in response rating (0.90) between the "most" and "least" parks.

(Tables 9A and 9B, Most and Least Comparison-Obstructions, follow.)

Table 9A Most and Least Comparison (Obstructions)

Comparison of responses to Question 9 between the 20 parks with the highest percentage of issues interpreted (among those affecting the park) and the 20 parks with the lowest percentage of issues interpreted.

Parks Interpreting Most Issues		Parks Interpreting Least Issues	
Affirmative Response[1]	**Obstruction**	**Obstruction**	**Affirmative Response**
95%	Inadequate interpretation staffing	Inadequate interpretation funding	100%
95%	Inadequate interpretation funding	Inadequate interpretation staffing	100%
84%	Inadequate interpretation facilities	Inadequate interpretation facilities	95%
65%	Inadequate communication	Lack of scientific background among interpretive staff	75%
58%	Lack of scientific background among interpretive staff	Lack of issue-oriented information	70%
55%	Inadequate linkage to planning documents	Inadequate linkage to planning documents	70%
53%	Lack of issue-oriented information	Lack of support by park and/or regional administration	55%
50%	Lack of support by park and/or regional administration	Inadequate communication	45%
40%	Lack of visitor interest	Lack of visitor interest	45%
30%	National Park Service management policies and guidelines are inadequate	Legislation limits scope of interpretive topics	40%
10%	Legislation limits scope of interpretive topics	National Park Service management policies and guidelines are inadequate	30%

[1] Affirmative responses are the percentages of all responses that indicate some significance (5,4,3, or 2).

Table 9B

Comparison of responses to Question 9 between the 20 parks with the highest percentage of issues interpreted (among those affecting the park) and the 20 parks with the lowest percentage of issues interpreted.

Parks Interpreting Most Issues		Parks Interpreting Least Issues	
Response Rating[1]	**Obstruction**	**Obstruction**	**Response Rating**
4.25	Inadequate interpretation funding	Inadequate interpretation funding	4.65
4.10	Inadequate interpretation staffing	Inadequate interpretation staffing	4.55
3.84	Inadequate interpretation facilities	Inadequate interpretation facilities	4.01
2.25	Inadequate linkage to planning documents	Lack of issue-oriented information	2.70
2.1	Inadequate communication	Lack of support by park and/or regional admin.	2.60
1.95	Lack of scientific background among interpretive staff	Inadequate linkage to planning documents	2.45
1.90	Lack of support by park and/or regional administration	Inadequate communication	2.39
1.80	Lack of issue-oriented information	Lack of scientific background among interpretive staff	2.30
1.60	National Park Service management policies and guidelines are inadequate	Lack of visitor interest	2.05
1.55	Lack of visitor interest	Legislation limits scope of interpretive topics	1.90
1.25	Legislation limits scope of interpretive topics	National Park Service management policies and guidelines are inadequate	1.15

[1] Response Rating is a weighted average of responses where 5.0 would indicate that all respondents said the obstruction was extremely significant and 0.0 would indicate not significant.

Ranking of Issues Interpreted

This ranking shows that the two natural resource issues that were most widely interpreted--by over 60% of the parks--provided information about park visitor activities and public safety. (See Table 10.) A great majority of the issues listed were interpreted by less than 50% of the parks, with most of these issues falling in the 35% to 9% range.

Table 10
Ranking of Issues Interpreted

Issues are ranked by the total number of responses received. Percentages are indicated in parenthesis and are calculated from a total of 203 questionnaires returned.

Ranking of Issues Interpreted	Number of Respondents (percentage)
1. Tourism/recreation activities	129 (64%)
2. Human and wildlife interactions	127 (63%)
3. Visitor damage to natural resources	113 (56%)
4. Threatened and endangered species (wildlife)	109 (54%)
5. Biodiversity	100 (49%)
5. Impacts on water quality	100 (49%)
6. Threatened and endangered species (vegetation)	97 (48%)
7. Exotic species (vegetation)	95 (47%)
8. Erosion and deposition	86 (42%)
8. Development adjacent to park border	86 (42%)
9. Habitat restoration or loss (vegetation)	83 (41%)

Ranking of Issues Interpreted	Number of Respondents (percentage)
10. Habitat restoration or loss (wildlife)	82 (40%)
10. Waste management and/or recycling	82 (40%)
11. Legal hunting and fishing	80 (9%)
12. Illegal camping and fires	77 (38%)
13. Exotic species (wildlife)	75 (37%)
14. Collection of plants	73 (36%)
14. Fire management	73 (36%)
15. Visibility	72 (35%)
16. Ecosystem management	69 (34%)
17. Flood hazards	63 (31%)
18. Loss of wetlands/other aquatic habitats	62 (31%)
19. Poaching (wildlife)	59 (29%)
20. Impacts on water quantity/water rights	53 (26%)
21. Off-road vehicle use	52 (26%)
22. Pest management (wildlife)	51 (25%)
23. Species reintroduction (wildlife)	50 (25%)

Ranking of Issues Interpreted	Number of Respondents (percentage)
24. Global climate change	48 (24%)
25. Vandalism (vegetation)	46 (23%)
25. Pest management (vegetation)	46 (23%)
26. Vegetation injury (air pollution)	43 (22%)
27. Livestock grazing	42 (21%)
27. Noise (aircraft, vehicular, etc.)	42 (21%)
28. Damage to cultural resources (air pollution)	41 (0%)
29. Acid deposition	39 (19%)
30. Species reintroduction (vegetation)	34 (17%)
31. Mining	33 (16%)
31. Inholdings	33 (16%)
32. Agriculture	29 (14%)
33. Human health (air pollution)	27 (13%)
34. Timber harvest	20 (10%)
35. Oil and gas	19 (9%)

Comparison With Cunningham Survey

In May 1984 Western Regional Chief of Interpretation Richard L. Cunningham distributed a report, *Interpretation of Natural Resources Management, Cultural Resources Management and Visitor Safety in the National Park System*, to all areas of the National Park Service. The report summarized the findings of a survey of all field areas conducted in 1983. A total of 235 parks submitted 1,400 responses identifying programs or activities interpreting cultural resource management, natural resource management, and visitor safety. Under the natural resource management section, 145 parks submitted 590 survey forms addressing 18 topics.

Close comparison of the 1984 Cunningham survey with the survey conducted by this committee is not possible, because of somewhat different objectives and methods. However, it is obvious that there has been a substantial increase in natural resource issue interpretation over the ten-year period. The Cunningham survey had a 70% response rate from 334 parks (the entire park system), but this included a nearly 100% return from "natural parks." Only 145 parks (62% of the respondent parks) reported interpreting any natural resource management topics. The NRIC survey found that at least 203 parks (100% of the respondent parks) were interpreting such issues in 1993. If all parks had been queried, the number could have been much larger. In 1983, only 24 issues (none of them air- or water-related) were reported as being interpreted; in 1993, over 150 issues were interpreted. Issue categories were somewhat broader in the Cunningham survey, but not broad enough to obscure the great difference between the results of the two surveys.

Five topics appear in both surveys. Table 11 compares the number of parks interpreting each topic in the two survey periods.

Table 11
Comparison of topics in Cunningham and NRIC surveys

	Number of parks interpreting issues	
	Cunningham Survey (1983)	NRIC Survey (1993)
Exotic animals	7	75
Collecting plants	11	73
Exotic plants	8	95
Fire management	26	73
Ecosystem Management	58	69

Analysis of Findings

Several developments probably contributed to the increase in natural resource issues interpretation over the 10-year period. Since publication of *State of the Parks, 1980*, natural resource issues in the parks have been widely publicized and natural resource management programs expanded. Between 1989 and 1992, the budgets for natural resource programs nearly doubled. To a lesser but still significant degree, interpretive training on natural resource issues also grew. In the mid-1980s, Cunningham conducted a series of five biogeographic theme workshops (e.g., desert parks) for interpreters on natural resource issues. In the late 1980s, the Mather Training Center offered a course on interpretation of critical resource issues and, extending into the early 1990s, topical resource management panels for interpreters.

Advances in natural resource issue interpretation occurred in spite of certain obstacles. The Park Service experienced the addition of new areas, static total budgets, and changing management directions. Since the bicentennial celebration in the late 1970s, park interpretive programs frequently have changed to meet Servicewide initiatives, often at the expense of park-focused programs (although two of the initiatives were on natural resource issues). While many new resource management specialists were trained and other natural resource programs grew, the involvement of interpretation in park natural resource projects was inconsistently implemented.

In 1994, the Natural Resources Interpretation Committee finds that much progress in natural resource issue interpretation has been made, but that more is needed. Pressures on park resources continue to mount, and the public must be informed and encouraged to care about this. These issues are vital parts of each park story and must be woven into park interpretation programs. Interpreters in many parks are eager to increase their interpretation of these issues but often experience constraints. As revealed by the Natural Resources Interpretation Committee survey, chief among these constraints are inadequate funds and staffing; lack of commitment by some park managers; insufficient training, education, and professionalization; limited access to information; and underdeveloped use of partnerships. Ways to address these issues are presented in the sections that follow.

Recommendations

Funding and staffing

> "This is so important--let's get directives and support from WASO on down!"
>
> Comment on NRIC questionnaire

Overview

The questionnaire respondents ranked inadequate interpretive funding, staffing, and facilities as the top three obstacles to interpretation of natural resource issues. These three also received by far the highest percentages of "moderately" to "extremely significant" ratings.

The Vail Agenda identified funding as a major problem in the management of the National Park Service. In each of the six strategic objectives, funding issues were addressed to varying degrees, and one may infer that greater amounts of funding for interpretation and education are recognized as part of those strategic objectives. The Vail Agenda suggests that increased National Park Service funding could be generated through a new gasoline tax, greater return of park entrance and user fees, or voluntary contributions through a tax "check-off."

Across the National Park Service, funding for interpretation operations in parks averages between 6% and 15% of a park's budget. As park budgets are reduced through inflation and pay raises, seasonal employees are often the first to be cut. Most parks rely heavily on seasonals to provide the majority of interpretive programs, especially during the main visitor seasons. Consequently, fewer employees are providing interpretive services in our parks. In recent years, interpretive programs (walks and talks) have been significantly reduced in many parks and in some parks eliminated. Visitor centers have been closed or are frequently operated by volunteers or cooperating association employees. In some parks visitors seldom see a National Park Service employee! Until the National Park Service as an agency and Congress as controller of the budget recognize the need for interpretation, including natural resource issues, and provide financial support at the park level, funding for interpretation will continue to remain a small percentage of a park's operation.

Recommendations

1. Within the National Park Service budgetary process, increase the FTEs and funding for park interpretive programs. Begin or enhance resource issue focused programs in park, regional, and central offices. Use the Vail Agenda recommendations as a basis to increase interpretation and education, resource stewardship and protection, and access and enjoyment of national parks to provide strong direction and financial support for interpretation in the National Park Service.

2. Encourage inclusion of funding for an interpretive component in all appropriate natural resource management projects and programs, such as the Natural Resources Preservation Program, to ensure the vital link between research, resource management, and the public. Within competitively-funded natural resource projects, this can be accomplished by adding points in the rating criteria for projects that specifically provide for and actively encourage interpretation.

3. Encourage park managers to develop grants through the National Park Foundation and other organizations or agencies to fund interpretation of natural resource issue projects. Use existing funding sources to seek matching funds from other organizations.

4. Utilize the cyclic maintenance and repair/rehabilitation programs to improve interpretive media in parks. Too often these programs are controlled by maintenance divisions and little gets directed toward maintenance of interpretive media.

5. Earmark a percentage of user fees for resource issue interpretation.

6. Include fund-raising for interpretation of resource issues as one activity of "Friends of the Park" groups.

Management Commitment

Overview

Interpreters provide a critical link between the National Park Service and a variety of publics, articulating the National Park Service's position on significant resource management issues. Park managers must make a conscious decision to use interpretation in this role, recognizing and accepting the difficulties and risks that may be involved in publicizing issues. Understanding of this interpretive function, and promotion of its success, must happen in each park. A variety of stratagems can awaken and maintain interest and commitment in responsible individuals.

"The Service should revise its philosophy, policy, and management approaches to reflect the legitimate role the agency has as a national public education system."

National Parks for the 21st Century

Recommendations

7. Develop Servicewide policy support for natural resource interpretation. A directive from the National Park Service Director should emphasize the role of interpretation in placing issues before various publics, with the expectation that these publics can then understand both an issue and the Park Service position. Such understanding could result in support for the Park Service's position, or at least better clarification of disagreements that arise.

8. Implement and support a "team management" approach in parks, including interpretive personnel as an integral part of most park operations; in particular, resource management and research. No specialist can know or predict the needs of other disciplines. Interpreting resource management issues must be a "product" developed by park management, resource managers, and interpreters working together through a process that ensures that the information needs and expectations of all parties are considered in a single, coordinated effort.

9. Incorporate resource issue interpretive statements into National Park Service guidelines. Guidelines in NPS-6 (*Interpretation and Visitor Services*) and NPS-77 (*Natural Resources Management Guideline*) define National Park Service operations. They must contain a clear definition of resource management issue interpretation. NPS-6 should be expanded to encompass appropriate interpretive procedures to carry natural resource messages to the public. NPS-77 should clearly define the need for data development and resource information transfer so that the resource, the issue, and the Park Service position are clear. The overview of interpretation should be expanded to formalize the linkages necessary between resource management, interpretation, and park management to effectively document and communicate resource management issues. "Natural Resources Interpretation" could be improved by integrating interpretation's involvement throughout the "Program Administration and Management" chapter. Specific guidelines, as exemplified under "Vegetation Management" in Chapter 2, should be expanded.

10. Establish planning document support for resource issue interpretation (i.e., interpretive statement in resource management plan project statements, GMPs, and interpretive prospectuses). In planning natural resource research and monitoring efforts in the parks, it is imperative that the information thus developed is available to interpreters. A specific requirement for information transfer should be incorporated into most resource manage-

ment action statements. Overall planning efforts must also address interpretation's information needs. To assure that the need to inform the public about resource management issues and projects is met, interpretation should be involved in resource-related planning efforts.

> "Natural resource and interpretive specialists should work together in the preparation of resource management plans, statements for interpretation, and other documents..."
>
> NPS-77

11. Include in the park's statement for management a list of issues identified as the most misunderstood and most likely to adversely affect park management. This will provide a focus for park management and staff to initiate education efforts before issues become inflamed.

12. Include criteria for resource issue interpretation in operations evaluation guidelines. Because the Park Service is committed to interpreting resource management issues, operations evaluations must consider the effectiveness of the effort, in terms of information development, transfer within the park, dissemination to the public, and utilization of feedback in refining management programs.

13. Develop a method to evaluate the effectiveness of natural resource issue interpretive programs in relation to the goals of each program. When we set a goal for interpretive programs/projects, we very seldom attempt to determine if we met the goal. We need to measure the effectiveness of interpretive efforts in order to redirect or redefine the message we present to the public.

> "... communication...can improve the public's understanding and support for plans and policies that the preservation of the park's resources imposes on their use and management."
>
> NPS-6

Professionalization and Training

Overview

In 1969 the GS-452 professional series "park naturalist" was abolished and replaced with the GS-025/026 series, which required no positive academic requirement and was therefore "non-professional." In 1985 the "technician" series GS-026 was abolished and merged with the GS-025 "park ranger" series, which further "de-professionalized" career opportunities and advancement. As a result, park interpreters (GS-025s) often feel stuck in low and middle grades with little chance of advancement. Many who hold undergraduate and advanced degrees feel frustrated at being asked to perform professional level work, such as management, research, and critical issue interpretation, while being classified in non-professional, lower-graded series.

> "How can we expect quality interpretation, which demands subject matter expertise, public speaking credentials, and knowledge of the National Park Service, when all we offer the large majority of our interpretive staff are: jobs that only last 5-6 months/year, poor wages, no benefits, and expectation of many hours of unpaid work in order to prepare for programs."
>
> Comment on NRIC questionnaire

Recommendations

14. Support the Career Committee of the Vail Agenda and the Ranger Futures Working Group in cooperation with the Office of Personnel Management in redefining standards in the GS-025 series.

15. Identify interpretive positions that require professional level performance and classify them appropriately. Series that may be appropriate for professional interpreters include park ranger, biologist, historian, archeologist, physical scientist, teacher, training instructor, and writer/editor.

16. Establish a requirement to maintain professional standing through in-service training and university courses.

17. Encourage attendance at and participation in professional society seminars.

18. Establish a series of critical resource issue workshops as Servicewide employee development courses. The workshops could have a geographic or topical organization to make them optimally relevant to participants. The focus would be on interpretive techniques and current information on the most critical regional and Servicewide issues.

> "Many interpreters today lack the academic background to easily grasp complex natural process issues. Develop series and grades with positive degree requirements in natural (and cultural) resource fields."
>
> Comment on NRIC questionnaire

19. Promote recruitment of natural resource interpreters at appropriate institutions of higher learning, including historically minority colleges and universities.

20. Develop theme-related cooperative park education units (CPEUs) as a complement to cooperative park study units (CPSUs) in the National Biological Survey. The CPEUs would be park-theme oriented (e.g., Rocky Mountain parks, tropical/subtropical parks) and located on university campuses near those environments. A Park Service employee would be a member of the faculty and serve as a liaison between appropriate university departments and client parks. This person would be an instructor at the university and coordinate the development of curriculum and resource materials for the client parks. (A prototype is being developed at the University of Massachusetts at Lowell.)

21. Develop an "Interpretation for Managers" course designed to introduce superintendents to "cutting edge" resource management interpretation. Related topics to include are: effective use of the public affairs function, integrating interpretation into park management, understanding how to use research effectively, risks and rewards of issue interpretation, identifying crises before they happen, and approaches to sensitive issues.

22. Provide seasonal employees with sufficient training to perform at a proficient level. Training should be on-going and the quality of information disseminated by each seasonal should be monitored throughout the employment period.

Information Availability and Transfer

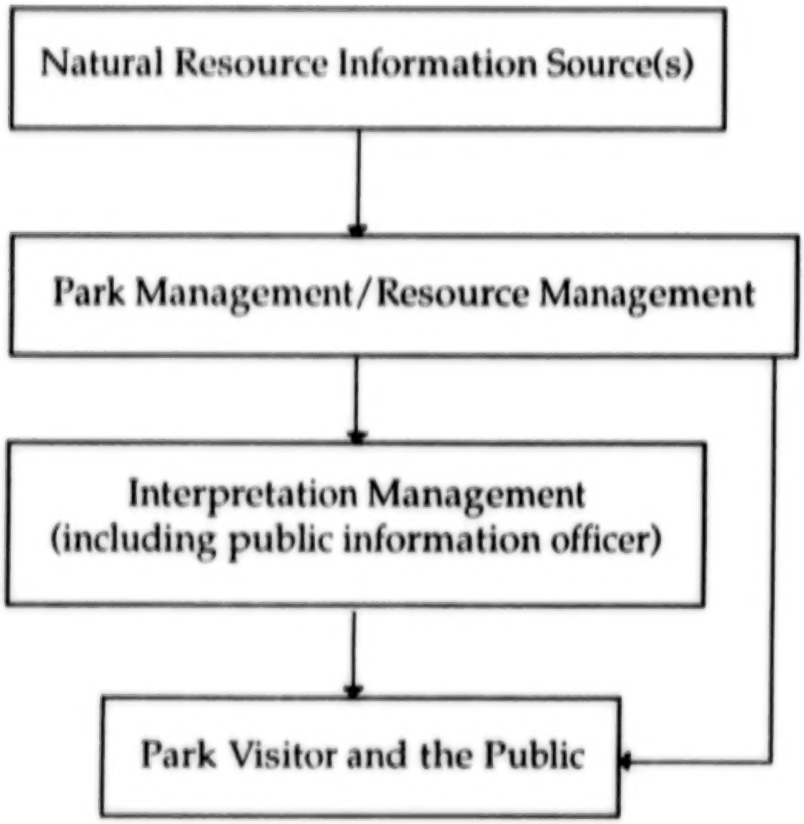
Overview

> "Research reports/annual research reports are frequently meaningless statements lacking useful information. All park staffs (resource and interpreters) are so overburdened with projects and obligations that time to read and summarize journals for colleagues is essentially non-existent. Simplify!"
>
> Comment on NRIC questionnaire

All parks need more information about their resources to serve interpretation as well as management. Presently, information on some resource management issues is deficient or entirely lacking. Interpreters often are forced to work with anecdotal information of questionable accuracy or, more often, avoid the subject entirely. Well developed information designed for easy retrieval of data on natural resource issues is scarce. Many sources of natural resource information--because of their presentation, location, or complexity--are not useful to interpreters. Research information generated in a park often does not reach interpreters. Personal interaction among interpreters, resource managers, and researchers is a necessary first step in the interpretation of natural resource issues. The need also exists for improved access to information collected or stored outside the park.

To facilitate the transfer of information within the organizational structure of a park, an Information Transfer Model is presented below for inclusion in park management systems. While this exact format may not be appropriate for all parks, it illustrates the necessary interaction between park management, resource management, and interpretation. It is important that each park define and formalize information flow, rather than "just hoping it will happen."

Information Transfer Model



Recommendations

23. Park interpreters should consult with for resource managers to identify informational needs for natural resource interpretive programs.

24. Existing National Park Service natural resource databases (e.g., Resources Management Plan Database, inventory and monitoring databases, Investigators' Annual Report Database) should be publicized, improved, and made more accessible to interpreters. For example, download selected data in individual parks for on-site retrieval.

25. Identify and provide access to existing annotated, computerized bibliographies on natural resource management topics. This would clearly be a benefit to both resources management and interpretive staffs.

26. Enhance or establish park libraries and information management standards to facilitate interpretation and resource management information sharing. Copies of all final park

research reports, for instance, should routinely be cataloged and placed in the park library. (See Appendix G for a list of recommended periodicals and reports.)

27. Require non-technical summaries of all research and resource management projects in parks--National Park Service-funded, National Biological Survey-funded, and other projects--as part of final reports or as a condition for obtaining a research permit. Develop methods of presenting non-technical summaries of resource management and research data and results as an ongoing "staff education" program at the field level, by park staff or by researchers working in the park. This information can then be conveyed to the public through professional interpretive and education programs.

28. Establish liaison positions in the divisions of interpretation and resource management to formalize and facilitate information transfer to both the park staff and the visiting public. Several parks have already established such positions with positive results.

29. Where appropriate, assign public information officer duties to the interpretation division to ensure consistent communication of natural resource management issues. This takes advantage of interpretation's professional skills in making information relevant and meaningful to the general public and management's interest in dealing with the public.

30. Design or use existing information systems, such as bulletin boards, interactive computers, site bulletins, and newspapers, to communicate natural resource management issues and programs within individual parks and throughout the National Park System. A good start can be made by providing interpreters ready access to investigators' annual reports, either on computer or hardcopy.

Audiovisual Media Needs

Overview

Audiovisual media support for resource management interpretation needs to be enhanced. Commercial television has created an expectation among our audiences for sophisticated media programs. Professionally developed videotape programs are extremely effective approaches for the classroom and other small group audiences, but the capability to deliver these programs is largely undeveloped in the National Park Service.

> "We tend to blitz everyone at seasonal training with information but fail to keep the communication flowing during the rest of the year."
>
> Comment on NRIC questionnaire

Recommendations

31. Develop audiovisual media support for resource management interpretation, particularly videotaping capabilities, conversion of slide libraries to a standardized digital format, and automated databases for accessing visual imagery.

31a. Basic training of National Park Service specialists in scripting, videography, video equipment care and maintenance, editing and other post-production skills is needed. A "skills team" cadre of audiovisual specialists needs to be strategically placed in support of resource interpretation activities.

31b. Readily available audiovisual technology must be provided to field staffs responsible for delivering programs on resource management issues. Essential video cameras and editing equipment needs to be strategically placed in parks and field support offices to fully realize the potentials of videotape production. Because of the professional quality required, video programs intended for the public might best be produced in a few production centers.

31c. Project statements developed to address natural resource protection, mitigation, and restoration needs should include provisions for audiovisual media documentation. Specialists should routinely document pertinent and relevant resource conditions and issues, project activities, and the successes and effects of resource management. Only minor adaptations should be needed to support interpretive programs as well. Resource

managers should make provisions for collecting images useful to interpreters and share these images with them. Interpreters should make a list of photographic needs available to the entire park staff.

31d. Slide libraries need to be converted to a standardized, state-of-the-art digital format, such as CD disks, to facilitate the sharing of 35 mm slide images among parks, regions, and program staffs responsible for developing effective educational materials for resource management interpretation.

31e. Parallel to the PROCITE software for bibliographic information, automated databases should be developed to allow specialists to network and locate and access needed visual imagery, throughout the Park Service.

Partnerships

Overview

Partnerships for interpretation of natural resource issues fall into three functional areas: funding support, information sharing, and stewardship activities.

Partnerships between park interpretation and natural resource management staffs are working well in some parks, as are efforts with cooperating associations, environmental advocacy groups, and volunteers in parks. There is, however, a need to enhance partnerships with local civic groups and "Friends-of-the-Park" groups (groups established specifically to assist parks).

The least utilized, and perhaps the most challenging, partnerships, with vast potential for the good of park resources, are those with concessionaires, the news media, and potential corporate sponsors.

> "The Service should strengthen the constituency for resource stewardship by developing new partnerships and by utilizing the educational, interpretive, resource management, and research capabilities of the Service and its partners."
>
> *National Parks for the 21st Century*

Recommendations

32. Funding Support: Actively pursue opportunities for alternative funding sources and mechanisms, such as donations, cost-sharing, and sponsorships, through cooperating associations, foundations, grant sources, and corporations.

33. Information Sharing: Cultivate innovative means of information sharing. Tours, field days, demonstrations, seminars, conferences, and symposia are a few of the many examples of non-traditional means of involving others in natural resource management.

34. Be pro-active in using the media to convey resource management information.

35. Stewardship Activities: Expand partnerships in stewardship activities, such as restoration projects and clean-up ventures. Adopt-a-Trail, Adopt-a-River, and other means of building "ownership" and pride among broad-based constituencies such as youth groups, school classes, native plant societies, garden clubs, and civic groups need to be fostered and marketed through coverage in the news media.

36. In each of these areas, there is a need to train National Park Service staffs in the skills involved in developing partnerships, providing administrative support to partnership ventures, and in professional quality assurance and quality control for programs and project activities.

37. Expand partnerships through ecosystem management initiatives among National Park Service units, with neighboring land and resource managers, and with publics in broader geographical contexts.

APPENDIX A

Survey Number _____

National Park Service

Natural Resource Issue Interpretation Questionnaire

TRACKING SHEET

INSTRUCTIONS

1. Please take a few minutes to respond to the attached questionnaire.

2. Fill in the tracking information below.

3. Return the completed survey to the committee using the attached pre-addressed envelope. If the envelope is lost, mail the survey to; Natural Resources Issues Interpretation Committee, c/o Dee Morse, NPS Air Quality Division, P.O. Box 25287, Denver, CO 80225.

Park Unit: _____

Survey completed by:

Name: _____

Position: _____

Phone Number: _____

Information on this sheet is for internal tracking purposes only! The tracking sheet will be separated from the survey upon its return to the Natural Resources Issue Interpretation Committee. There will be no way for the committee, or anybody else, to link specific responses with any individual or park unit.

Thank you for your time, effort and ideas. We will make every effort to utilize this information fully to develop recommendations for improving the interpretation of natural resource issues in the National Park Service.

National Park Service
Natural Resource Issue Interpretation Questionnaire

1. On the list below, please check all of the **Water** Resource Issues that are currently affecting your park. Then, please indicate how those issues are interpreted in your park using the codes below*. More than one code may be used for each issue when appropriate.

Issue affecting park	How interpreted in park*	
____	_____	IMPACTS ON WATER QUALITY
____	_____	FLOOD HAZARDS
____	_____	IMPACTS ON WATER QUANTITY OR WATER RIGHTS
____	_____	LOSS OF WETLANDS/OTHER AQUATIC HABITATS
____	_____	OTHER Please Specify:_____
____	_____	OTHER Please Specify:_____

2. On the list below, please check all of the **Air** Resource Issues that are currently affecting your park. Then, please indicate how those issues are interpreted in your park using the codes below*. More than one code may be used for each issue when appropriate.

Issue affecting park	How interpreted in park*	
____	_____	VISIBILITY
____	_____	VEGETATION INJURY
____	_____	HUMAN HEALTH
____	_____	DAMAGE TO CULTURAL RESOURCES
____	_____	ACID DEPOSITION
____	_____	OTHER Please Specify:_____
____	_____	OTHER Please Specify:_____

* Use the following number codes for answering questions 1-6. More than one code may be used for each issue when appropriate.

0 - Not interpreted in park.
1 - Wayside exhibits
2 - Museum exhibits
3 - Free publications (park produced publications, site bulletins, park newspapers)
4 - Sales publications
5 - Personnel Services (walks, talks)
6 - Audio visual programs (films, video tapes)

3. On the list below, please check all of the **Faunal** Resource Issues that are currently affecting your park. Then, please indicate how those issues are interpreted in your park using the codes below*. More than one code may be used for each issue when appropriate.

Issue affecting park	How interpreted in park*	
____	_____	HUMAN AND WILDLIFE INTERACTIONS
____	_____	EXOTIC SPECIES
____	_____	PEST MANAGEMENT
____	_____	SPECIES REINTRODUCTION
____	_____	LEGAL HUNTING AND FISHING
____	_____	POACHING
____	_____	THREATENED AND ENDANGERED SPECIES
____	_____	HABITAT RESTORATION OR LOSS
____	_____	OTHER Please Specify:_____
____	_____	OTHER Please Specify:_____

4. On the list below, please check all of the **Floral** Resource Issues that are currently affecting your park. Then, please indicate how those issues are interpreted in your park using the codes below*. More than one code may be used for each issue when appropriate.

Issue affecting park	How interpreted in park*	
____	_____	COLLECTION OF PLANTS
____	_____	EXOTIC SPECIES
____	_____	PEST MANAGEMENT
____	_____	SPECIES REINTRODUCTION
____	_____	VANDALISM
____	_____	THREATENED AND ENDANGERED SPECIES
____	_____	HABITAT RESTORATION OR LOSS
____	_____	OTHER Please Specify:_____
____	_____	OTHER Please Specify:_____

* Use the following number codes for answering questions 1-6. More than one code may be used for each issue when appropriate.

0 - Not interpreted in park.
1 - Wayside exhibits
2 - Museum exhibits
3 - Free publications (park produced publications, site bulletins, park newspapers)
4 - Sales publications
5 - Personnel Services (walks, talks)
6 - Audio visual programs (films, video tapes)

5. On the list below, please check all of the **Land Use** issues that are currently affecting your park. Then, please indicate how those issues are interpreted in your park using the codes below*. More than one code may be used for each issue when appropriate.

Issue affecting park	How interpreted in park*	
____	____	MINING
____	____	OIL AND GAS
____	____	DEVELOPMENT ADJACENT TO PARK BORDER
____	____	INHOLDINGS
____	____	TOURISM/RECREATION ACTIVITIES
____	____	TIMBER HARVEST
____	____	AGRICULTURE
____	____	LIVESTOCK GRAZING
____	____	OTHER Please Specify:_____
____	____	OTHER Please Specify:_____

6. On the list below, please check all of the **Other** Resource Issues that are currently affecting your park. Then, please indicate how those issues are interpreted in your park using the codes below*. More than one code may be used for each issue when appropriate.

Issue affecting park	How interpreted in park*	
____	____	ILLEGAL CAMPING AND FIRES
____	____	OFF ROAD VEHICLE USE
____	____	WASTE MANAGEMENT AND/OR RECYCLING
____	____	NOISE (aircraft, vehicular, etc.)
____	____	VISITOR DAMAGE TO NATURAL RESOURCES
____	____	FIRE MANAGEMENT
____	____	GLOBAL CLIMATE CHANGE
____	____	BIODIVERSITY
____	____	ECOSYSTEM MANAGEMENT
____	____	EROSION AND DEPOSITION
____	____	OTHER Please Specify:_____
____	____	OTHER Please Specify:_____
____	____	OTHER Please Specify:_____

* Use the following number codes for answering questions 1-6. More than one code may be used for each issue when appropriate.

0 - Not interpreted in park.
1 - Wayside exhibits
2 - Museum exhibits
3 - Free publications (park produced publications, site bulletins, park newspapers)
4 - Sales publications
5 - Personnel Services (walks, talks)
6 - Audio visual programs (films, video tapes)

7. Are there current active "partnerships" or other programs to interpret Natural Resource Issues in your park? Please rate the involvement of each with a score from 1 to 3. If the category is not involved write NI. (3= HEAVILY INVOLVED, 2= SOMEWHAT INVOLVED, 1= SLIGHTLY INVOLVED, NI= NOT INVOLVED)

____ CONCESSIONAIRES

____ COOPERATING ASSOCIATIONS

____ LOCAL CIVIC GROUPS

____ "FRIENDS OF THE PARK" GROUPS

____ EDUCATIONAL INSTITUTIONS

____ VIPs AND SCAs

____ PARK RESOURCE MANAGERS

____ PARK OR INDEPENDENT RESEARCHERS

____ OTHER. Please specify: _____

____ OTHER. Please specify: _____

____ OTHER. Please specify: _____

8. Do you now have or do you plan to have a curriculum (school) based educational program that deals with Natural Resource Issues?

YES NO

9. Please rate the significance of the following obstructions to the interpretation of Natural Resource Issues in your park. Please score each topic from 1 to 5 (5=EXTREMELY SIGNIFICANT, 4=VERY SIGNIFICANT, 3=MODERATELY SIGNIFICANT, 2=SOMEWHAT SIGNIFICANT, 1=NOT SIGNIFICANT).

____ RESOURCE MANAGEMENT PLAN INADEQUATELY LINKED TO INTERPRETIVE PLANNING DOCUMENTS

____ INADEQUATE COMMUNICATION BETWEEN RESOURCE MANAGEMENT, RESEARCH AND INTERPRETATION

____ LACK OF AVAILABLE ISSUE-ORIENTED INFORMATION

____ LACK OF VISITOR INTEREST

____ LACK OF BASIC SCIENTIFIC BACKGROUND AMONG INTERPRETIVE STAFF

____ ENABLING LEGISLATION LIMITS THE SCOPE OF INTERPRETIVE TOPICS

____ NPS MANAGEMENT POLICIES AND GUIDELINES FOR INTERPRETATION ARE INADEQUATE

____ LACK OF SUPPORT BY PARK AND/OR REGIONAL ADMINISTRATORS

____ INADEQUATE INTERPRETATION FUNDING

____ INADEQUATE INTERPRETATION STAFFING

____ INADEQUATE INTERPRETATION FACILITIES

____ OTHER. Please specify: _____

____ OTHER. Please specify: _____

____ OTHER. Please specify: _____

____ OTHER. Please specify: _____

10. In your opinion, what measures should be taken to improve the interpretation of natural resource issues in the National Park Service?

11. Is there anything else you would like to tell us about interpreting natural resource issues at your park or in the National Park System?

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APPENDIX B

Other Natural Resource Issues Identified by Respondents

Other Water Resource Issues

Development causing runoff into park streams
Development increasing runoff and soil loss
Sand and gravel operations
Encroachments
Livestock grazing
Clearcutting on watershed near park
Siltation and timber debris
Yucca Mountain nuclear waste repository
Oil and coal mining
Oil spill impacts
Water rights and irrigation
Upstream dam/water diversion
Impacts of dams
Colorado River ecosystem/Glen Canyon Dam
Fluctuating water levels in reservoir
Lack of water history and prehistory
Flow easement
Lowered water table
Drinking water lost when springs dry up
Drought
Timing of water distribution
Collection of tidepool inhabitants
Anchialine ponds
Cave hydrology/watershed protection
Cave water quality
Salinity
Salt water intrusion
Acid rain impacts to cultural resources
Loss of historic vistas and scenes
Salmon spawning
Native T&E species
Fisheries habitat
Shoreline erosion
Water recreation
Navigability - states rights
Groundwater/karst relationships
Groundwater impacts
Lake Superior watershed issues
International waters
Coastal pollution/marine debris
Maintenance-related issues
Water needs for water-related resources
Protection of potholes
Volunteer stream cleanups
Preservation of thermal systems

Other Air Resource Issues

Smell from paper plants, pulp mills	Smell/odor
Smoke from prescribed fires	Temperature inversions occasionally in winter
Night clarity for star gazing	Ozone pollution
Air quality	Deposition of toxic chemicals
Aircraft fuel dumping	Development pressures and loss of vegetation needed to aid air cleaning

Other Faunal Resource Issues

Over-population of native species, including white-tailed deer	Preservation of biodiversity
Grazing	Cattle displacing bison, etc.
Range management	Effects of development on adjacent lands
Gypsy moths	Wildlife diseases such as rabies, lyme, etc.
Domestic animals	Pets/feral pets
Faunal species lists	Faunal natural heritage
Insular populations	General research
Cave biota study	Helicopter impacts on native birds

Other Floral Resource Issues

- Alternations due to land-use conversions
- Range management
- Damage to riparian zone by upstream dam
- Recreation impacts (trails)
- Trampling cryptobiotic soil crusts
- Preservation of biodiversity
- Restoration of historic scene
- Revegetation of road
- Historic vegetation management
- Wildlife impacts due to ecosystem imbalance
- Endemics
- Human health (poisoning/stinging nettle)
- Livestock grazing, etc.
- Effects of development on adjacent lands
- Effects of pollution on plants
- Visitor impaction of soil
- Human impacts
- Species reduction (exotics)
- Floral manipulation
- Earthwork management
- Cultural landscapes
- Impact from exotic fauna
- Disease

Other Land Use Resource Issues

- Hazardous waste from mining, oil, and gas
- Property encroachment
- Land-management practices adjacent to park
- Historical land use
- Effects of past land uses
- Fossil collection
- Interagency and [illegible] management
- Aviation overflights
- Outside impacts
- Park boundaries
- Water diversion
- Weapons testing and development
- Land acquisitions
- Fiber optics installation
- Abandoned mine lands (historic)
- Relic hunting
- Subsistence
- Florida Keys National Marine Sanctuary
- Utility rights-of-way
- Scenic easements
- Inappropriate National Park Service facilities in park

Other Resource Issues

- Non-compatible trail use (horse and bicycles)
- Mountain bikes over-use
- Back country, wilderness, river management
- Meadow management
- Cultural resource preservation
- Vandalism of cultural resources
- Preserving resources in working system
- Agency functions
- Removal of drift logs
- Endangered species
- Native American land rights
- Rock climbing (new routes)
- Wilderness and back-country camping
- Human waste management in high elevations
- Cultural landscape management
- Cultural resources affected by natural resource issues
- Archeological resources
- International resource management issues
- Subsistence uses
- Exotic species
- Special park uses
- Lack of resource information (basic data)

APPENDIX C

Other Partnerships Identified by Respondents

025 rangers
Adjacent nature centers
Adjacent state parks
Alaska marine highway ferry system
Amtrak on-board interpretive program through wetlands
Appalachian Mountain Club
Archaeology
Area businesses
Citizens' advisory council
Cleveland, Ohio, area foundations
Cleveland and Akron, Ohio-based area educators
Commercial use licenses
Cruise ship companies
Elk foundation
Endangered species (trade)
Environmental Protection Agency
Glacier institute (private, non-profit environmental education and college-level field seminars)
Licensed users (horse riders)
Local Chamber of Commerce
Montana Fish and Wildlife and Parks Department
Other agencies--S. Appalachian and Biosphere co-op
Special interest groups--environmental groups, consumptive use groups, etc
State biodiversity
U.S. Fish and Wildlife Service
U.S. Forest Service-Hiawatha
Upper Delaware council
USFS interpretive partnership
Watershed partnerships
Woods deforestation/rainforest (ship building)

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APPENDIX D

Other Obstructions to Interpretation Identified by Respondents

- Afraid to make enemies not focused on topics outside of main interpretive themes (historical).
- Positions to bridge gap between divisions of interpretive and natural resources.
- Involvement of park interpreters in the early stages of program/issue development...too many times we find out AFTER the work is done.
- The battlefield is a cultural resource.
- Interpretive focus is on cultural resources, not natural resources.
- Cultural resources have priority.
- Original authorization of park for cultural resource preservation and appreciation/education.
- Primary focus on cultural resource interpretation and lack of funds, staff, and facilities for additional focus.
- Non-historical structures for interpretive use.
- "Elitist" attitude of natural resource folks--"we're too highly educated to deal with mere interpreters."
- Lack of team approach by researchers, resource managers, interpreters.
- Resource managers and support do not view interpretation as part of management team formed to deal with resource problems.
- Inadequate education fund/support.
- Non-existent environmental education faculty.
- Educational areas
- High turnover affects quality of interpretation staff, doesn't have time to become familiar with the details and depth of material.
- Inadequate resource management staffing, limits ability also to interact with and train interpretive staff, never mind manage the resources.

- Lack of resource management specialist position.
- Resource Management Plan not complete.
- Not in enabling legislation.
- Lack of basic interpretive background among scientific staff.
- Inadequate knowledge of topics.
- Lack of research.
- Lack of information on measuring interpretive effectiveness.
- Lack of understanding of resource issues by law enforcement rangers in the field.
- Lack of interpretive staff interest in knitting natural resources into historic theme due to lack of training for the interpretive staff.
- Non-acceptance of non-traditional interpretive activities.
- Training.
- New to my Chief I&M position, I haven't stressed natural resource interpretation as much as I'd like to.
- Lack of understanding by park administration that interpretation is a process and not an end-product like a restroom.
- Sensitivity of issues.
- Inadequate understanding and respect of human resources within the park's community to help resolve natural resource issues.
- Collateral duties.
- Outdated, fixed museum exhibits and need for upgrade of interpretive exhibits.
- Time.
- Lack of communication with local government natural resource agencies.

APPENDIX E

Comments on Questions 10 and 11, Natural Resource Issue Interpretation Questionnaire

Responses to Question 10: In your opinion, what measures should be taken to improve the interpretation of natural resource issues in the National Park Service?

Funding

- Interpretation needs funding, both on a national and at a park level. Interpretation is under-funded throughout the National Park Service. For example at Voyageurs in 1982 the Division of Interpretation had a permanent staff of four and one-half, and a seasonal staff of ten. In FY93, the staff consisted of three permanent members and three seasonals. One permanent position has been vacant for three years. During the same period the interpretive staff has decreased, the workload has increased dramatically! Two new visitor centers have been built, interpretive activities have expanded, and the public affairs program has mushroomed. The result: hours at three visitor centers have been cut; volunteer couples, college work-study students, and SCAs help operate visitor centers and help conduct naturalist-guided activities; interpretive equipment and vehicles are inadequate; and some jobs don't get done, or are accomplished in a below-average manner. One of four major entry points into the park has no interpretive presence.

- A very effective way to "improve the interpretation of natural resource issues" would be to provide more funding to interpretive programs in general. The resulting expansion of these programs would, as a matter of course, improve natural resource interpretation.

- Information is available. We need funding and staff to provide for the interpretation of issues to the public.

- Rather than a continual stream of initiatives-of-the-month such as global change, seasonal initiatives, biodiversity, environmental education, economic stimulus, parks as classrooms, and so on, where all parks compete with each other for limited/any funds, allocate the funding directly to the parks as an increase in base funding and allow park management to devise programs/interpretive efforts to suit the local issues. Overall park interpretation and natural resource interpretation will benefit.

- Support and encourage an interpretive portion to resource studies funding requests.

- Money and trained personnel--parks are short on both parts, yet budgets and personnel continue to be cut. Continuous "doing more with less" is a poor substitute for trying to achieve overall management objectives.

- Elevate the value and significance of interpretation, clearly demonstrated by ample funding and staffing.

- Enhance funding to interpretation, so that they can interpret those natural resource issues. Instead of utilizing all those funds FY 1993-94 to resource management, research, etc., some need to go toward interpretive functions.

- Ensure adequate funding for permanent and temporary interpreters.

- The biggest issue is funding. Our offering of interpretive programs here has dwindled to almost nothing...we're doing lots of information work but had to cut programs drastically this year.

- When you do not have funding to open historic structures, it is difficult to justify natural resource interpretive programs. In an urban setting such as Valley Forge, past natural resource interpretive programs haven proven to be well-attended; therefore, it is not a matter of need or interest, but rather priority of subjects to be interpreted. Given more funds, I and my staff and especially the natural resource management specialist would be more than willing to present natural resource interpretive programs.

- Funding--you'll note that we deal with almost every resource issue through personal services; however, you can hardly ever find a ranger--we are an endangered species. And when [funding] becomes available apply directly to field operations.

- Fund positions in natural resource interpretation, both permanent and seasonal.

- Make more funds available to implement.

- If the Washington Office can't get adequate funding then parks need to be linked with other sources (e.g., National Park Foundation) without having to expand lots time and energy on writing grants; perhaps each region could have a grant-writer for such purposes.

- Increase staffing to adequate levels so interpreters have time to get more involved with resource issues.

- Fund the programs (base funding): fund support positions, i.e., graphic design, writer-editor positions in parks.

- A change in the mind set of traditional funding for interpretive operations is necessary. Heretofore, the programs in individual parks has been largely personality driven. Under the auspices of particularly effective individuals, budget and staffing increases, then

declines under the management style of the successor. Such an ebb and flow of resources can no longer by tolerated. Recommend that interpretation look to adapt other existing strategic management tools to complete its metamorphosis to a full-functioning essential arm of park management. For example, consider revising the statement for interpretation format to include updatable individual project (or operational) requests necessary for priority interpretive operational needs. Look towards a model based on the resource management plan software used in the preparation of the resource management plans. Similarly, anticipate that interpretive funding to individual parks will increase and decrease in response to project/issue-related funding above a basic funding level included in the park's operating base. Increase manager accountability for planning for project/issue-related interpretive operation support increases via the statement for interpretation, use of such funding, and oversight of the design and content of such operations. (The statement for interpretation in this form, together with the resource management plan database, could also be required to identify the corresponding project statement(s) in the respective document). Finally, the most controversial aspect of the above proposal: establishment of a regionally-based interpretive fund to provide project-specific funding supplements based on priority statement for interpretation project statements. The last twist is that these funds would not be added to a park's base but would be provided by the regions for the fixed term of the project needs, then made available for assignment to other parks and their projects. A direct secondary effect of this procedure is the upward development of strategic interpretive program needs to the regions and the Washington Office. This sets the stage for clear mission-oriented justifications for additional interpretive funding as part of the Park Service budget.

- Increase work force so we can work on this type of interpretation. We are so busy responding to everyday problems and demands that little time is available to develop better interpretive programs.

- This is a park-by-park issue and cannot be improved by blanket policy. The best support would be better funding for development of issue-oriented information.

- More emphasis on education for both students and adults and more funding for small parks to initiate programs in natural resources.

- Get us funding for staff and facilities. We are currently operating below minimum interpretive standards developed by this park. Almost all of our facilities are pre-World War II.

- Funding and support needs to be concentrated in and directed to ongoing and developing programs in the parks. It is certainly possible to target dollars through initiatives and via project-based funding in resource management plans. This cannot be promoted and directed solely from the Washington Office. Decreasing staffs, too many competing and increasing demands, including escalation of collateral duties and yet another glossy brochure--generic and limited in supply--are barriers. Interpreters are interested in continuing and expanding their interpretation of resource management issues to

enhance public understanding and support, but human resources must be expanded in the field areas (where they have been shrinking for the past five years) and they must be professional interpreters.

- Interpretation needs to get the priority it deserves along with resource management/science (which came to the forefront in the 1980s). Funding sources such as NRPP should be available to include interpretation of issues linked to resources.

- Better funding, staffing, and support for interpretation from the Washington Office on down. Provide larger permanent interpretive staffs and a lot more will be done.

- To improve the status of natural resource interpretation in the National Park Service, two things are needed. One is money and the other is workdays.

- Needs vary throughout Park Service. Our primary need is for funding and staffing for all park functions.

- Currently the park has inadequate funding and staffing to interpret natural resources. In my most recent visits to natural areas, I have viewed AV programs, used self-guiding trails and leaflets, read the park brochures, viewed the museums. All seemed adequate. However, there is a real lack of personnel available to the public to perform personal service interpretation.

- Better funding and staffing of both functions so that we have opportunities to interact and not just keep the visitor center desk open and natural resource crises from dominating our routine.

- Money and FTEs.

- Providing priorities and funding to natural resource projects are also important. Often interpreters are given too many priorities. They do the ones they have funding and staff for. When resource issues are addressed by park managers often interpreters are left out of the loop or brought in far too late. For instance, if a park becomes concerned about an issue like air quality then a skilled interpreter should be a part of the decision-making team from start to finish. Often managers don't use the tools of interpretation to solve resource issues except as an afterthought: "Oh, yeah it would be nice to have an exhibit on air quality," after the project money is spent and the research is done. Interpretation should be thought out and funding tagged on to every natural resource issue project before it is ever done.

- Funding available to develop interpretive wayside programs.

- Interpretation needs to be taken seriously--and that means an infusion of funding and staffing. Most parks have long lists of potential programs just waiting for funding.

- More funding for interpretive staff, free publications.

- A strong commitment to natural resources demonstrated through additional budget, staffing, and equipment to properly monitor the resources.

- The principal problem at our area is lack of staffing and funding. You can only do so much with what we have. Our current National Park Service management places more worth on LE and administrative functions and interpretation is often left behind. Interpretation is usually the smallest, least-funded division.

- Funding: There is a universal need for increased levels of funding for interpretation--particularly for off-site educational programs and staff, exhibit rehabilitation and development. Need for funding for interpretation exhibits for current resource problems.

- Increase funding and support for the interpretive programs in the parks.

- Baseline data for each park. FTE/funding for interpretation use of data.

- Program funding rather project funding.

- When examining plans/programs for interpretive operations priorities are made based on legislation and funding. Adequate funding/staffing would enable development of interpreting natural resource issues programs.

- Provide adequate funding to the field.

- Funding and staffing.

- The National Park Service needs to focus more on interpretation. All funding and support has been toward law enforcement and resource management in last three to five years.

- The relationship being what it is, I now need more money--to develop media and personal services programming. The parks around Lake Superior are trying to work together to interpret resource management and research as part of the Binational Program to Restore and Protect Lake Superior, but there is no money for publications/traveling, exhibit design and production, or even travel for us to do quality networking. I have identified the need for such funding in the annual statement for interpretation, and the park's outline of park requirements. Next step--apply to the National Park Foundation for $$.

- Dedicate more people and funding.

- Provide more funding to have more staff available to handle the interpretation of natural resource issues.

- National park areas possessing natural resources, commemorating primarily natural features and vistas, are constrained by diminished funding and staff. Outdated facilities and media mitigate against interpretation of natural resource issues.

- Redirect appropriations to mission-oriented objectives (such as interpretation of natural resource issues) and take away funding Servicewide, away from programs that merely maintain a fat bureaucracy but do little or nothing to actually accomplish real mission of the National Park Service (visitor service and resource protection).

- Servicewide funding support of interpreters attending NAI and ESA/George Wright annual meetings. This training and dialogue should be as mandatory as refresher law enforcement training. This could be accomplished by piggy-back conferences or dazzling content of conferences.

- Ensure that non-personal services receive positive emphasis and funding: exhibits, bulletin boards, TIS messages, sales items, site bulletins, park newspapers, park brochures.

- How much is this survey costing--money that could be in the field.

Training

- Increase training opportunities for specific subject matter resource concerns.

- Inaugurate an Interpretive Skills-type class devoted to this topic. This would enable interpreters to be more sensitive to these issues when dealing with visitors.

- On a national level, training for interpreters is inadequate at both the park and the regional level. Without skillful interpreters, the quality of the interpretive program sinks into mediocrity, and the image of the National Park Service deteriorates.

- Mandate that all researchers provide a minimum amount of training & education for the interpretive staff during the course of the project and at its conclusion.

- More training/education of interpretive staff about natural resources.

- Provide better training for field interpreters.

- Additional training courses on topics relating to interpretation of natural resource issues. We have an outstanding research and resource management team in the park. Our interpretive staff is, in general, well-grounded in natural resource issues. Some, however, are inexperienced and would improve with natural resource issue training.

- Better in-service training for interpreters in resource management issues and concerns.

- Revitalize the training program "Interpretation of Critical Natural Resource Issues" that Harpers Ferry Center once sponsored.
- Increase quality and availability of orientation to resource management training: require resource management and science personnel to have both training and duties (providing up-to-date, easily understood information) in interpretation.
- Quality training opportunities paid by centralized training funding (when required to pay for interpretive training with National Park Service park-base funds, priorities usually go to something else).
- Cross-train interpreters and resource managers--maybe combine those duties more.
- Training.
- Provide more resource-based training opportunities for interpreters, particularly those who lack scientific educational background.
- Additional training and funding to interpret natural resource issues. Perhaps establish a coordinator position in each region to facilitate the intervention/information exchange between resource management and interpretation.
- Stress training of law enforcement personnel and other field-oriented staff in resource-related interpretation so they can communicate these issues to visitors.
- Improve staffing and training programs for interpreters.
- Give interpreters training and experience in the resource management field.
- Give natural resource managers training in basic interpretation and give them some in-park cross-training. Interpreters would love to work in the field in exchange for natural resource staff working with visitors. We need to understand their issues and they need to understand ours.
- More training/information on interpretation of national resource issues. More shared information on this type of interpretation.
- Training should be paid for at the Washington Office level (for sources in critical resource issues as well as core curriculum interpretive skills courses).
- Basic training in resource problem identification and correction techniques (floral, fauna, air, and water) that apply to small and large parks -- money to fund the sessions should not be the burden of the benefiting account.

- A 24-hour annual refresher should be given to all employees conducting interpretation. The annual refresher would update employees on new interpretive techniques as well as keep their current interpretive skills sharp.

- All other employees not in interpretation should be required to complete a 16-hour class on communications and interpretation immediately after being first hired. Once again the training class should be a video/lesson format which could be completed by self study if a structured class is not possible.

- All other employees not in interpretation should be required to complete a 16-hour refresher class on communications and interpretation every two years.

- The single most important measure that should be taken to improve the interpretation of natural resource issues is to improve interpretive training. Every new interpreter should be given a 40-hour basic interpretive training class to start immediately after first being hired. A training video/lesson plan should be developed for the 40-hour training class. The video/lesson plan should be self sufficient. In the event that the 40-hour training class cannot be given to the new employee immediately after being hired, the employee should be required to complete the class in its self-study format.

- Expand interpretive natural resource training.

- Provide specialized training on specific issues for temporary interpreters.

- Ensure cross-training for all interpreters.

- Provide more training on how to relate resource concerns effectively.

- Training: Increase variety of correspondence-type training that can be accessed by park staff--would assist with tight budgets and small staffs.

- There needs to be more education of interpreters regarding natural resource issues (put the issues on the table).

- More natural resource and issues interpretation training for interpreters.

- Provide interpretive staff much better training in working through the mass media.

- In some parks perhaps it would be possible to do some cross training or at least observation of resource work on problems every month.

- There needs to be support and training from the regional office for all sites in the region. We need resources to either hire staff who have the knowledge and expertise in this very specialized area of interpretation or provide intensive training for staff.

- Joint training--need to get resource staff, researchers, and interpreters together at workshops, conferences,and meetings. We need (must!!) learn from each other.

- The single most important measure is in the area of interpretive training for both seasonal and permanent interpreters. A truly systematic and mandatory training agenda needs to be funded above the park level. Otherwise interpreters will continue to work several years before receiving adequate training.

- More attention (training about) natural resource issues.

- I believe that the single most important competency which must be developed in all park staff, especially interpreters, is communication. Most interpreters have no communications training and in my view are not strong communicators.

- Formal training, either in classroom setting with subject matter experts to explain natural resource issues and perhaps help formulate interpretive program ideas, or at the lest videotapes to help interpreters identify issues and give suggestions about interpreting them. Also, more environmental education training--Project Wild, Project Learning Tree, Joseph Cornell--should be made available to interpreters.

- Ensure an adequate interpretive staff:
  - Well-trained in basic science principles
  - Well-trained in interpretive principles
  - Well-trained in communications skills
  - Well-trained in people skills
  - Well-trained in non-personal services KSAs

- Management issues should be developed (identified) pertaining to natural resource issues. These should become interpretation themes (primary) and then resource managers from those areas of expertise must be asked to present at seasonal or staff training.

- There is a need to cross-train resource managers and interpreters. Many resource managers need interpretive techniques and skills training. Just because a researcher knows how to write a thesis or a field study, or can give a lecture to fellow researchers, does not mean that they can write an article for a newspaper or text for a display, or give an effective talk before park visitors. If the information is not interesting, no matter how factual it is, no one will read it or listen to it and, thus, what is the point? On the other hand, professional interpreters who are trained to communicate and have the skills to interpret the resources will not be effective if they do not possess some training in resource management techniques and terminology. If we employ professional interpreters and take the time to train them in the resources and resource management skills, and if we train resource managers in interpretive skills, we will produce interpretive materials that are resource-based and readily available to visitors in any number of effective mediums. At times communication between the two divisions is the biggest

stumbling block in getting research and resource data to the interpreters. Resource managers don't always have the time to get away from their paperwork, research, or work with independent researchers to deal with interpreters. Interpreters are under the same constraints and are not as free to get away from heavy work schedules or to get project time with resource managers. If a liaison position could be created that dedicated one person's time to both divisions then that person could be the avenue of communication and training needed to get resource information and concerns to interpreters. The end result would be more effective and accurate programs getting to the public.

- Operations consume available human resources for interpretation. Increasing one's knowledge and familiarity with natural resource or cultural resource issues is not typically regarded by many staff and management as that important. That's unfortunate. More interpretive resources and greater management and staff sensitivity to the value of in-depth knowledge are essential.

- Training: Law enforcement staff go to FLETC for 12+ weeks to earn their commission; interpreters should also be sent to an interpreter's commission! Parks must make the commitment in time and dollars, but it will be time and money well spent on permanent interpretive personnel. Also, all seasonal employees should go through Interpretive Skills I prior to giving interpretive programs.

- Because Cedar Breaks is such a small park, resource management issues typically are those that originate outside of park boundaries (visibility, adjacent land development, "animal damage control" actions, grazing, timber harvest, etc.). It is difficult to interpret some issues without appearing to take aim at "culprits" outside the park (private landowners, corporations, other government agencies) without fear of offending someone in the audience or suffering political repercussions. Interpreters should be trained to discuss these issues in such a way that is sensitive to other points of view, without casting blame on any group(s), be it hunters, Forest Service, ranchers, oil companies, etc. Here in southern Utah, especially, many visitors do not share the same philosophy of land stewardship as the National Park Service interpreters. It takes a special effort to be able to discuss certain issues in a way that foster support for National Park Service instead of strengthening the ill feelings that some already have toward the National Park Service.

- Interpretation training is hard to get; most courses are "benefiting account" that automatically puts out anyone from our park. Natural resource training is impossible to get in the Park Service.

Professionalization

- Hire seasonal and permanent interpreters with natural resource education and/or background.

- Permanent interpreters in the National Park Service are expected to be experts at too many things. They are expected to be naturalists, historians, education specialists, exhibit planners, writers, publishers, designers, accessibility coordinators, AV wizards, trainers, supervisors, administrators, VIP program coordinators, librarians, public information officers, etc.... We are given these duties often with little priority direction, funding, or training. My point is, if effective natural resource issues interpretation is desired then interpreters who do just that need to be hired. This does not mean hiring seasonals to do the job. More often than not, seasonals don't have the necessary training or skills and those that do don't stay around for long. Just as many park staffs have natural resource management specialists, GIS specialists, biologists, botanists, etc., there needs to be a specialist for natural resource issues interpretation. I would envision such a position working for the park's division of interpretation but assigned to work right along with the park natural resource management staff. All natural resource interpretation would be handled or coordinated by this position; exhibits, publications, public information, training of interpretive and education staff, etc... This alone is a full-time job and needs to be treated as such.

- Provide more interpreters with natural history background.

- We cannot have an outstanding interpretive program without numerous outstanding interpreters well versed in their subject matter. Get the grades up, develop a meaningful career ladder with sufficient pay and promotion potential to retain skilled staff, and quit treating interpretive staff as second or third class people!

- Require a degree in related field of work. We need to use classification series (existing, old, or new) to hire educated interpreters. We need staff who can communicate as well as understand and be conversant in natural and cultural resource fields. Lets look at reactivating the old NATURALIST series.

- Create resource interpreter positions to be placed on either resource management or interpretive staff [that would require] a sound biological or cultural background and education [and would] serve as a go-between to carry information between operations. Yellowstone and Grand Canyon now have such positions. They would perform training, "interpret" scientific studies, and provide expertise in communicating scientific knowledge to the public. Require resource councils at each park where managers (including interpretive) meet to discuss and resolve resource issues. Ownership in the decision is everyone's and each staff can offer their expertise and commitment to solve the problem.

- Convert and upgrade seasonal interpretive positions to GS-7 (should be if they interpret two significant themes) and make them S-T-F. Only when we have staff around for a while, will we put the training into them we need to make them the best at interpreting our resources and related issues. We've got to invest to be the best!

- Stronger academic standards for seasonal personnel. Ensure only the best-qualified employees are selected.

- Facilitating recruitment of permanent seasonal staff with appropriate academic backgrounds and (more importantly) active interests would help. For example, having a degree in environmental science is insufficient background for an interpreter lacking passion for the work. I would love to see hiring regulations which would allow us to hire gifted, articulated, committed "amateurs" with a readiness to learn.

- If we want professional quality interpretation, we need to start putting our money where our mouth is.

  1. Pay people competitive decent wages for the professional work they do (at least equivalent of GS-9 for seasonals).

  2. Provide them with job security, permanent employment, and appropriate benefits.

  3. How can we expect quality interpretation, which demands subject-matter expertise, public-speaking credentials, and knowledge of the National Park Service when all we offer the large majority of our interpretive staff are jobs that only last 5-6 months/year, poor wages, no benefits, and expectation of many hours of unpaid work in order to prepare for programs?

  4. Not only do we have trouble hiring well-qualified people, but we have difficulty retaining qualified staff.

- More emphasis should be placed on locating and hiring staff with stronger science-oriented background. In conjunction with this, once on staff, regular interaction must be encouraged and supported by park management between interpretive personnel and research/resource management staff.

- Require interpreters in natural areas to have natural science degrees.

- Increase both natural resource staff and interpreters and make the positions permanent so that as soon as you train them they don't leave for a private/local government job.

- Establish a position or create a bonafide interpretive--research liaison in all parks. It's difficult to expect seasonals to interpret natural resource issues--particularly controversial ones--if they are not furnished with easily accessible and accurate information that helps interpreters learn a maximum amount of information in a minimum time. The research liaison could also invite special subject matter experts to lead discussions and provide information and training for interpretive staff.

- Professionalize the interpretive profession by establishing appropriate educational standards for park interpreters.

- More staffing, deeper and more variable staff educational and skill backgrounds/levels.

- Improve/streamline/facilitate the ability of supervisors to fire dead-weight employees.

- Improve supervision for field interpreters.

- Professionalization of IVS staff in natural science areas.

- Professionalize: Rangers (including especially managers who rose-up through the ranger ranks!) need to recognize the importance of interpretation in all aspects of park management. Get off their high horses where rangers are considered gods who do all things. Specializing/professionalizing with a team approach is better than the one-man-does-it-all approach/historical National Park Service ranger approach.

- Hold resource management and science staff accountable for performance standards.

- For new developing parks, a natural resource position needs to be identified in interpretive planning documents. Where funding and expertise is not available, there should be assistance from regional offices.

- More emphasis on employing people with experience (not just education) in natural resource issues that are related to our areas. Examples:

  1. We have marine biologists working in desert parks as interpreters.

  2. Personnel hiring practices need to be more specific on knowledge, skills, and abilities need on each position.

- Provide leaders through MOU--political appointments--promote competent leadership with scientific field experience to restore the integrity of the National Park Service.

- Professionalization of interpretive personnel. Develop series and grades with positive degree requirements in natural resource-related fields. Many interpreters today lack the academic background to easily grasp complex natural process issues.

Resource Management/Interpretation Interface

- The greatest barrier to effective interpretation of natural resource issues is the lack of flow of information between the resource management and interpretive divisions. We have attempted to alleviate this problem in our region by developing a series of seminars. Interpreters are introduced to the "meat" of pertinent resource management topics by resource managers. Informational fact sheets are prepared on each issue and given to the interpreters at the seminar.

- With the creation of the 401 series for resource managers, I see a greater emphasis on employing scientists and technicians to manage natural/cultural resources. Too often these folks lack the insight to realize the importance of interpreting their work to the public. An interpretive product (brochure, program, etc.) should be tied to every resource management project statement in the resource management plan.

- Breaking down of parochial barriers between interpretation and natural resource managers.

- In parks I have worked in, the marriage between interpreters and resource managers and researchers has been very good. I worry that establishment of the National Biological Survey will take many of our "friendly neighborhood scientists" out of our reach for informal dialogue over coffee...

- Increase communication, particularly at park level, between resource management specialists and interpretive specialists.

- Identify the process of interpretation in the resource management plan. We certainly can identify steps that have to be taken as we "complete our research to attain that final output." Interpretation also has to have measured output. It also has to proceed in steps and evolve along the way. Are we not talking about a resocialization of the public in the realm(s) of natural resources at parks as educators resocialize students in schools? Interpretation has to be thought of as a process in and about parks and not just an end product to produce (e.g., wayside, tour).

- Coordinate, develop communication lines between interpretation and resource management staffs.

- Address under "actions" section of project statements in resource management plan where, how, and what interpretation will do to address problems.

- Natural resource management and interpretation are equally vital to the implementation and public perception of park management decisions. It is important that research, inventory and monitoring occurs for each park area, and that all scientific data is then used by the Interpretive Division for the education of the entire park staff, local schools, visitors and community outreach. There have been voids in sharing current scientific information between the resource management division and the interpretation division. At Capulin Volcano National Monument, there is a cooperative agreement for geologic research, which included interpretive staff briefings and interpretive exhibits of the research. When scheduling permits, resource management and interpretive staff will be in the field with the researchers; we feel that this is an excellent means of exchanging information. We also recommended a scientific publication by the researchers, that our cooperating association will sell at the bookstore. We feel that it is important for both divisions to interact.

- Interpreters needs exposure to resource management so that they intuitively know how to best integrate it into personal and nonpersonal services.

- Interpreters should work regularly with resource managers periodically to get a first-hand knowledge of resource issues in the department. This would enable interpreters to get a feel of the problems so as to discuss/interpret with visitor and or the public in general.

- Increase communications between resource management/research/science divisions and interpretation divisions in parks that have such dedicated and delineated operations. Several large parks (e.g., Everglades) seem to encourage this exchange of information very well. This enables the visitors to leave Everglades with a good understanding of why it is the most endangered park in the system. I would like to see other parks make even better use of communications of this type.

- Resource management plans should incorporate and address the role of interpretation in educating and informing the public of resource management issues in the parks. Interpreters need to work closely with local school systems incorporating resource management issues and alternatives in the curriculum-based environmental education programs. Teachers should be involved in the program development.

- Integration of natural resources into individual unit theme.

- Tie planning and funding of resource management projects to planning and funding for interpretive staff and facilities.

- Grand Canyon's Division of Interpretation developed and established a liaison position between interpreters and resource management. This person attends resource management meetings, actively stays informed regarding resource issues, and then formally arranges presentations at interpretation division meetings. This position also arranges guest programs at division meetings. We've had updates in fire management, USFS forest parasites, air quality, and endangered plants. This program has accomplished much in improving communications and accurate information. This position is a permanent GS-5 (401 series) and also functions as a front-line interpreter.

- First, and probably most obvious, is communication between resource management, research, and interpretation. This communication link must be a two-way channel; resource and research personnel should be updating the interpretive division on a regular basis, the frequency of which needs to be determined on a park-by-park basis depending on the number of resource-related issues and staffing levels. One way this communication could take place effectively could be through staff meetings or even monthly updates in the form of memorandums. At the same time, interpreters must be aware of resource issues affecting the park and must also make an effort to communicate with the resource and research personnel. Interpreters can offer many possible solutions to resource issues before they become a serious threat. Goals and objectives for both disciplines must be shared so a common knowledge is known. Even though we have separate divisions in the National Park Service and in most park units, we are all working towards the same goal of "preservation and protection of the cultural and natural features for future generations."

- Research needs to be integrated with interpretation. In order to affect public opinion and influence visitor behavior, it is essential that resource management respond to visitor use and the needs of interpretation. The greatest threats to the resources come from people. (Do we ever view natural events as threats?) Therefore, we need to get

our messages to this public. Some research should be directed to the immediate needs assessed by interpretation. Granted, that much research cannot concern itself with the immediate needs of the public. However, we should devote a greater percentage than is now allocated for information that can be directed to visitors.

- In order to modify visitor attitudes, garner support for management decisions, encourage cooperation with park regulations, and maintain a foundation for operational changes, we need the public as a partner. The recent public relations fiasco with the northern spotted owl is an example of resource management not well tied to interpretation. If the public had been fully informed of the true nature of the issue (indicator species, forests as ecosystems, etc.), we might have been able to foster a more positive public support nationwide and in the media. Looming large are the coming battles over salmon and the snowy plover on California beaches. If interpretation is involved early and as a full participant in the Section 7 process, the groundwork can be laid for public support. The one area where some success has been visible is in fire management. A greater percentage of the population now understands the natural role of fire than ten years ago. But the next time we have a fire situation like Yellowstone in 1988, will we have a receptive public?

  Suggestions:

  1. Resource management plans should be a joint effort between interpretation and resource management with the interpretation and public education elements built into the plan.

  2. No research should be conducted without a defined process for its publication or other dissemination.

  3. Interpretation personnel should participate in resource management programs.

- It is critical to include interpretation in research and resource management planning. Projects that receive funding should always include money for interpretation both during the life of the project and to interpret the findings.

- Resource managers need to develop a closer working relationship with park interpretive personnel. Through a cooperative effort program approach, goals and objectives could more easily include resource concerns in our interpretive programming. Secondly, historical parks with significant natural resources should consider some time and staff devotion to interpretation of natural resource issues.

- Integrate interpretation and "interpretive solutions" to resource management issues in resource management planning.

- Improve communications among natural resource staff and interpretive staff; e.g., cross training, combined conferences, etc.

- We need to get managers and scientists personally aware of what is being done by interpreters. Then they can critique the "message" in a more informed way.

- There's a need for a persistent "push" from above to ensure that interpretation is plugged into the resource management planning and programming cycle from the outset and remains plugged in throughout. Periodic self-evaluations are needed to ensure the timely transmission of current resource management and research information to interpretation and to see that this information, in turn, is being used to generate interpretive programs that are effectively addressing management issues and concerns. There are a number of model parks in the system who already have their resource management and interpretive programs in synch; they just need to be spotlighted and to have other park managers "strongly encouraged" to emulate them.

- Integrate interpretation, law enforcement, and resource management division more so each division knows what the other is doing, and they can support each other, because knowledge of and respect for resources fosters protection.

- Park management should ensure that resource management and interpretive staffs frequently communicate with each other. This open line of communication will keep interpretive efforts up-to-date with resource issues.

- Better communication between researchers, natural resource managers, and interpretive staff.

- Better communications between resource ma..agement types and interpreters.

- Resource management (natural and cultural) and interpretation must become more integrated at the national, regional, and park levels. There should be regular and routine communication between these functions. Interpreters must be kept up-to-date on resource management issues and concerns and must be prepared to communicate in a clear manner these topics to the public.

- Joint meetings at all levels between resources management and interpretation staffs.

- Resource management staff should have overview authority for interpretive programs. Resource managers should "sign off" on all interpretive programs for accuracy and appropriateness (including waysides, all printed material, films, videos, museum exhibits, etc.).

- This agenda should be set at the Washington Office and regional levels for parks to follow.

- Interpretive programs should be more closely aligned to resource management planning and actions. Close interfacing between divisions could provide greater scientific information base and more easily supported interpretive program objectives.

- Staff meetings must include sharing between divisions to educate employees to environmental problems in general and on our sites. From the superintendent to administration, the division of interpretation must glean information and use it for programming. All employees, however, interface with visitors, especially maintenance workers. Our behavior and comments will register with visitors our dedication or neglect of natural resource issues. Interpretive planning documents and programs that inform the public of environmental concerns and encourage personal responsibility for the protection of National Park Service sites and the surrounding communities are essential.

- Servicewide fostering of a routine interchange between researchers (National Park Service and contract) and interpreters. Researchers provide data to interpreters, interpreters request research needed to provide data they require to improve the information they provide to the public.

- Better link from resource management staff and activities to interpretive division.

- Interpreters need to be involved in resource management projects. They need to go into the field, see the project develop, and grow so that they can ask questions and get the details that will make interpretive programs more lively, exciting, and relevant to the visitor. At the very least, resource management training on critical issues should be provided for interpreters, preferably in a mixed class so that the interpreters could interact with resource managers.

- Interpreters need to spend more time in the field actively involved in resource issues. There is no better way to instill "ownership" of resource interpretive issues than to involve the interpreter on a level where they feel they can make a substantial, relevant contribution. Plus, as an organization we **must** be willing to embrace controversy--we cannot please everyone, nor should we try. Our primary objective is resource preservation. To that end we must speak to the public about the "truths" of resource protection as we know them, using the best that science, philosophy, and emerging thought provides us.

- A sincere dedication by resource managers to involve and inform park interpretive staff.

- I believe that the greatest single measure to improve the interpretation of natural resource issues would be to require the direct and personal involvement of individual interpreters in implementing resource management actions. Obviously, interpreters are most knowledgeable, interested, and credible with the public if they have personally experienced the subject that they are required to interpret.

- I believe other measures, such as regular meetings between resource management and interpretive staff, the preparation of briefing statements on various topics, etc., are also effective, but not nearly so as direct and personal involvement with the resource.

- A continued working together and sharing of information between the park resource manager, researchers and park interpretive staff.

- Promote long-term personal involvement of resource managers with their parks and impacting communities. Longer area assignments will enable resource managers and interpreters to develop their level of expertise as well as their influence in the community.

- Improve the interface between resource managers and interpreters.

- Get management (region, Washington Office, park) to back resource management programs and then emphasize the need to interface between resource managers and interpreters.

- Don't allow physical layout to hamper communication and cooperating. Place interpretive and resource management staff "on top of each other" physically so that all important dialogue between staff in adjacent offices works to our advantage. At Grand Canyon resource management staff is two miles from headquarters! They might as well be in the next state--no informal exchange/learning takes place.

- I feel strongly that interpretation, research, and resource management work closely together. Information flow should go in all directions between these divisions.

- There needs to be more interaction between the resource managers and researchers and interpreters. I see more training sessions at the park level as the key as well as sharing research information.

- Interpretation should be involved in developing resource management plans, and "interpretation" should be a component of all resource management plans and all action plans. Likewise, interpretations' statements for interpretation must include those issues!

- Each interpretive position should have a portion of their time assigned to resource management so that the two divisions could develop a working partnership. This would not only increase the effectiveness of the interpreters, but would also simplify the public relations portion of resource management, as visitors obtain a greater understanding of the National Park Service purpose through factual interpretive programs.

- Improvement is needed in communication with other divisions on resource management issues. Natural resource issue interpretation is extremely important at Dry Tortugas National Park, therefore the interpretive staff should be selected for their natural science background or be adequately schooled in the issues prior to them being placed in a position of relaying park views on resource issues.

- We need to improve, if possible, the communications between all those involved: i.e., interpreters, managers, resource specialists, researchers, etc.

- More day-to-day involvement between interpretive and resource managers and researchers (question on National Biological Survey will affect this--especially negatively!)

- Develop open lines of communication between natural resource managers and interpretive staff. More combined training between natural resource management and interpretation. Natural resource managers active involvement in interactive planning.

- Superintendent, resource management specialist, researcher, law enforcement personnel, and chief of interpretation need to work a project as a team from start to finish.

- Improved working relationship with resource management division. Cross training, informal sessions, participation in interpretive training.

- Inclusion of resource issues in basic interpretive planning (SFT) and interpretive prospectus.

- The new resource management development program is turning out some arrogant, professionally narrow-minded, and parochial managers.

Need natural resource issue information

- Develop an easy-access database for resource issues in the National Park Service. Issues may include research topics, university projects, etc., that are of national significance or local significance. Many park areas are working on similar programs, therefore making "networking" essential. Develop it like cc:Mail, where customers (interpreters) can get specific information via a computer remote modem, thereby granting instant resource information.

- Enhanced distribution of park-specific data resulting from direct research and/or as gleaned from journals. Research reports/annual research reports are frequently meaningless statements lacking useful information. All park staffs (resource and interpreters) are so over-burdened with projects and obligations that time to read and summarize journals for colleagues is essentially non-existent. Simplify!

- I believe that some natural resource issues and information is not given to interpretation. Sometimes interpretation is the last to know. Maybe providing interpreters extra copies of resource management publications and information would help.

- Cooperative agreements with scientific institutions and universities.

- Follow through on requirement that researchers have "user friendly" report to leave with park interpreters.

- Interpretive staff should automatically receive important resource management documents and results of studies (from field staff to high levels).

- Encourage (and fund as necessary) good, management-oriented science (i.e., applied science). Discourage (and eliminate where possible) so-called research that generates countless statistical tables, graphs, and drivel that pass for science, but impact the parks just as much, or more, than good science, without producing unusable results.

- Mandate that all research projects undertaken within parks must produce a summary of their work and findings written in popular style. No popular publication--no permit. For contract research, final payment is contingent upon the popular publication.

- Basic inventory and monitoring should be completed in parks prior to large-scale interpretive efforts so that interpretive staff knows what resources exist in the park. It is difficult to provide accurate resource interpretation until the park resources are known and understood.

- Provide for face-to-face information sharing.

- Completion of resource management plans, resource base inventories, information sharing/availability and training, along with additional staff, funding, and, if necessary, facilities.

- Interpretation and natural resource issues should be based on scientific data.

- Require summaries of research, written in lay-person/average interpreter language.

- Library that is functional, where information is indexed and retrievable. Currently, we (interpreters) stack materials and file, but not using library procedures. Tons of information is available, but overwhelmingly difficult to find.

- Develop a natural resource component to the cultural resource bibliography program.

- We need to determine what we have (inventory and monitoring) before we begin to interpret our natural resources. Basic information and effects of acid rain, ozone, etc.--what is the best approach? Question reminds me of old question--what came first the chicken or the egg?

- Resource management should identify specific topics that they would like interpreted and provide the info, stats, and even perform an interpretive program. As information changes as data is collected and interpreted, it should be passed on to the interpretive staff.

- Do more research--until we have a basic knowledge of what we have, interpretation is going to always be very superficial.

- Development of reading lists, fact sheets, position papers on various regional, national, and global issues. Employees in remote parks are often unaware of books/publications on issues/current thought.

- Resource information needs to make it to interpreters.

- Research needs to be presented in a way that is readily understandable to the layman.

- Staff or regional scientist for area.

- Allow resource managers and interpreters wide latitude in travel in order to interface and network with the broad scientific and managerial community.

- More consistent development of materials which focus on general interpretation of natural resource issues. We've had a push to interpret acid rain and biological diversity--both of which have fizzled. There is a need to present Servicewide sessions on interpreting natural resource issues through the Interpretive Skills program perhaps, by establishing an Interpretive Skills IIIC--Interpreting Natural Resource Issues. There is a need for consistent funding for interpretive programs across the Service.

- Our resource management plan is being rewritten at present. Recently, we hired a new facility manager with a commitment to natural resource issues. We are in need of knowledge acquired through research, funding, and personnel to identify natural resource problems, historic landscape concerns, and interpretive staff to develop interpretive program goals and objectives. Fortunately, we are situated amongst several colleges and universities equipped to assist in our assessment of natural resources. Preliminary contacts have been made and steps will be taken to address pertinent concerns more thoroughly in the near future.

- Stop strangling field interpreters with paperwork. We are, if nothing else, good communicators, yet many of us are simply clerks working on reports that nobody reads anyway. Why is there no "40-hour refresher" for interpreters? We keep up on resource issues by reading *Audubon* or *Sierra* magazines, and often we get much more from these sources than from our own agency.

- Provide more research and studies at the park on natural resource inventories and develop monitoring programs.

- Interpreters are asked to provide programs that relate to research projects that are currently in progress. Often, the only information that is available on these projects is public knowledge or general published materials. It is very difficult to explain the reason for these projects, the process, and the expected outcome when you have no first-hand knowledge of the subject matter. It is practically impossible to convey the emotion of an issue and spark the visitors' interest when you have not experienced this emotion yourself. Reports of findings are provided to interpreters almost as an after-thought at the conclusion of the project. Often, these reports are very dry and list only

summations. Intermediate steps, the thought process involved, trial and error, and unique activities of the project are left to the imagination of the interpreter.

- Dialogue should be encouraged (where feasible) between bi-national "linkage" parks/researchers/data. We needn't remain as parochial as in the past.

Natural resource issue interpretive programming

- Interpretation of natural resources in national parks is already done very well. There needs to be more acknowledgement that the most effective interpretation is done with personal services. Handouts and free publications, waysides, and exhibits cannot replace the personal touch. As much or more money needs to be put into employing interpreters as is spent on materials and elaborate exhibits and displays. The information and knowledge in the parks will be more effectively distributed through personal contacts. Exhibits and waysides are effective, but not always timely when dealing with resource issues. Most resource management concerns change with time. Waysides or exhibits must be reviewed periodically and updated as needed. This is expensive, but is necessary to maintain park credibility.

- Personal services are not the answer in all cases. Nonpersonal services such as exhibits, waysides, AV, and publications will reach many more visitors and if properly designed can be as or even more successful than talks, walks, and educational programs.

- More partnerships with other agencies and private sources. This should be encouraged by superintendents (some do, some don't [fortunately our superintendent does!]).

- Time and work load limit the ability of interpreters to conduct independent research and to prepare programs. Hours spend at the visitor center desk are not "free" time. The expectation that interpreters can study and prepare a program while serving the individual need for the visitor is unrealistic. Staffing should be adjusted so that there are enough field interpreters to cover information desk duties while others are being allowed adequate time to prepare programs.

- I am not located in a park area, and therefore do not have the opportunity to fill out the "Questionnaire for Interpretation of Natural Resources." I would, however, like to express my opinion to you on this subject. I feel very strongly about interpretation of natural resource issues in our national parks. I feel that support of this idea needs to start in Washington, and definitely in the regional offices. There are some park areas across the country that are already interpreting critical natural resource issues on their own, even without this support. Park visitors are usually already supporters of our national parks. They are intelligent, and want to know more than superficial information/orientation. They want to know about these issues, how it affects the parks, how it might affect them, and what they might be able to do about it. No, we don't want to lecture at them about these issues, but we do need to interpret them. Interpretation of natural resource issues doesn't just end with personal services in the park areas. The

information needs to also get out beyond the park boundaries. In order to accomplish this, there needs to be a bridge between interpretation and natural resource management and research, in the Washington Office, the regional offices, and the parks. The field of resource management has grown so quickly in the last ten years, and interpretation has not been able to keep up. Aside from interpretive programs and media, we need to work with each other in the planning stages, starting with the resource management plan and interpretive prospectus. The public information officer needs to be involved to also help get this information out to the public, even when a crisis situation doesn't exist. I sincerely hope that this questionnaire reveals to us that interpretation of natural resource issues is essential for today's National Park Service. Conservation of our natural resources is in peril. We need to gain as much public support as possible to help us carry out the mission of the National Park Service. We can do this by interpreting natural resource issues to park visitors and the American public at large. The HOW do we do it is now the question. We need more than lip service and paperwork. We need to start doing it now. I had no intention of taking up so much paper when I started this. But I hope you get my point. I am glad to see this questionnaire going out to the parks, and will be very curious to see what the outcome is. I would like to offer my services towards this effort if you feel I can help. Otherwise, please keep me on your mailing list, and keep me informed of your progress. Thanks for giving me this opportunity to express my opinion on this very important subject.

- National Park Service interpretation must acknowledge that its role is not that of educator, visitor experience provider, but of public relations and support builder, employing any and all available historic, contemporary, and developing methods of communication as an essential element of park management and the management of park resources. The task before the National Park Service is to professionally respond to the increasingly complex and often controversial environment in which park resources find themselves. It is a task that interpretation must confront directly.

- In parks that have significant resource issues, bring these to the forefront when formulating the park statement for interpretation.

- Increase public interactive/participation as program/topics allow.

- While there may have been a regional office or park management-based worry that more needed to be done to "get the resource management or science message out," that was largely a false impression based on that these folks rarely if ever paid any attention to what interpretation was doing (Acadia is a lot healthier than some parks in this respect). Could this be true Servicewide?

- The Resource Acadia idea can meet the need of higher content programs available to an interested and enthusiastic audience. Also, having a person hired to be a link between resource management and interpretation really helps facilitate the passing of accurate, in-depth information. One difficult area is the media/press aspect that slips into the more controversial resource issue topics. I like the idea of an information specialist who would address the public in this role.

- Produce films, videos, and school outreach programs to focus on resource issues.

- Our interpretive prospectus does not identify themes for interpreting natural resource issues. Interpretive prospectus needs to be updated with natural resource themes added.

- Upper management must allow interpreters to interpret critical issues affecting the park.

- Scientists need to trust interpreters to do their jobs. We will use different terminology and innovative techniques to, literally, interpret the work of scientists and resource managers. Scientists need to get rid of their proprietary feelings about their research results. The public wants to know about research and is totally able to understand scientific issues.

- More non-personal media in historic parks, such as site bulletins or guided trails.

- I believe it is currently good, at least in parks I have worked. Continue to make available to the public issues that affect the park. Do not let managers say, "that topic is too hot for the public to understand." If there is a problem or issue, lets tell the public. Get resource managers more active in presenting programs to the public. Involve maintenance more.

- I feel that interpretation should be brought to the attention of visitors through an information booth and roving tour guides.

- Any chance I get, I talk about the value of field interpreters from parks with similar themes getting together to share "nuts and bolts" ideas for effective environmental education. We as an agency don't do enough of this kind of communication. Parks with similar themes the next state over might as well be on the moon, particularly if they are in separate regions and the chiefs don't even get together.

- The Alliance conference being held in the winter of 1993 will help improve the relationship between the interpretation and natural resource issues.

- My park is a small cultural resource, day-use park, average length of stay 1-1.5 hours. Visitors do not come to learn about natural resource issues, although environmental themes can be tied into the past history which this site commemorates.

- Even the great destination parks--the "crown jewels"--lack the most basic resources to provide anything but basic orientation and visitor services to increasing numbers of visitors. Were the capability there, it must nonetheless be recognized that visitors come to parks as an escape from the "issues" bombarding them by the media. The "Clearing the Air" and "Biodiversity" interpretive thrusts failed because of their earnestness, over alliance on obtuse data, and too-technical concepts, alongside the unavailability of resources to carry the message through. These concerns must be addressed before any viable interpretation of natural resource issues in the parks can be addressed.

- All new films about National Park Service sites should address natural resource issues rather than just orienting visitors.

- The Servicewide brochures are developed and distributed with little input from field personnel. Too many times the supply does not meet need or in a few cases exceed the need. When parks are not getting adequate supplies of their brochures and unsolicited "issue brochures" arrive in the park (many times unannounced) it is hard to explain why we have the "wrong brochures." A four-color, glossy brochure is not the only way to communicate/interpret an issue.

- Provide seminars in rural areas educating farmers and ranchers, etc. in results of pesticide usage, predator control, etc.

- Currently, historical and cultural landscapes are managed under natural resource management guidelines. This is impossible to do effectively. Separate guidelines should be developed and implemented.

- Glen Canyon interpreters need to develop theme statements for interpretation (instead of listing topics). Topics give no guidelines for issues interpretation; whereas, statements would.

- A plan for natural resource issues, and priorities for interpretation--best methods delineated.

- Develop Junior Ranger Natural Resource programs.

- Basically work very hard with children and educational programs.

- Interpreters can interpret anything but not everything. Parks need to decide what it is that is important to interpret and then focus resources and staff on those priorities. It should be a park decision not a division decision, otherwise the division's idea of what's important may not be what is truly important for the overall good of the park. I could elaborate more on this topic if necessary. It's a topic long overdue for discussion and its important that we do natural resource issue interpretation effectively.

- National Park Service managers have to stop thinking of interpretation as a "collateral duty function."

- Marketing importance of program to park managers.

- Need a better understanding of political and other constraints, if any, on public airing of controversial issues. How far can/should we go? How much support can we expect. Who is we?

- Involve local schools (all levels) in using the parks as classrooms for environmental education programs.

- When natural resource issues are not the primary interpretive focus for an area, offer better guidance to management, resource management, and interpretive staff as to how much time, effort, and money should be devoted to natural resource issues.

- Bring back or utilize Y.C.C., interns, or local civic groups in resource management projects so they may learn by doing and foster a greater appreciation of the resources and protection of them.

- This is a cultural area. We do not have the funding to either conduct needed research or do as much interpretation as we would like. While there are natural issues, they are not addressed unless they deal with visitor safety in Lyme disease or rabid wildlife life. This is provided as a part of visitor use information.

- This survey makes me worry about "canned" programs that fit anywhere. Parks need to be able to meet interpretation needs in their park specifically.

- Items of national, international, or global concern should be addressed by all parks in the system in one way or another. Often Servicewide initiatives such as air quality, biodiversity, or global warming are not addressed by all National Park Service units.

- Require that interpretation of natural resource issues be a required goal for all site interpretive program managers.

- Having worked in a goodly number of natural areas I believe we have been and are now doing good jobs in them. I believe we should "think globally and interpret locally." We should avoid topics such as global warming in park programs because of inconclusive scientific data. Even the "ozone hole" is shaky because of inconclusive and conflicting data. Scientific data on acid rain is plentiful and tested and provable and with local examples. People do not come to the parks to hear about world problems. They attend interpretive programs in parks to learn about the natural history of the place. It is a disservice to visitors to encumber park programs with heavy global issues to the detriment of the park story.

- It must be kept in mind that in over half the National Park Service areas, natural resource interpretation is not mandated by Congress. Those cultural and resource issues mandated by them must take first place. This frequently leaves natural resource interpretation with little or no resources.

- Provide interpreters with more office encouragement and authorization to interpret controversial issues.

- Separation of natural resources as an interpretive focus from historical and cultural areas. Since all park areas, no matter what is the primary designation, have natural, historical, and cultural components, it makes more sense to weave interpretive components together instead of the "disease of the season" approach that characterizes some natural resource interpretation. If acid rain or biodiversity are valid as themes, they are valid

long after the sort of "hit and run" emphasis characteristic of many of our short-lived interpretive thrusts.

- Wean interpreters away from the "touchy-feely" superficial form of interpretation to interesting discussions of issues, based on some solid facts.

- De-politicize the National Park Service so we can talk about spotted owls, wolf re-introduction, and grazing problems. Have clear agency guidelines on specific issues and provide field interpreters with training and factual information on these issues.

- Care is taken to inform visitors of present day and historical practices that impact the land, air, and water. For example, litter, the negative impacts of pollution historically from certain manufacturing processes and procedures. There are many kinds of trees and shrubs on this historic site which have been identified. However, inventories, environmental surveys, and planning are necessary to locate endangered species, problems with degradation and erosion, and possible hazards to the visitor or local residents (e.g., high lead content in the soil surrounding historic buildings.) Ultimately, in order to improve the interpretation of natural resource issues in the National Park Service we must put our words into action. We must commit our whole staff to purchase and use patterns that reduce environmental waste and damage. Recycling, reusing paper for note pads, and establishing a safety plan that includes proper disposal of toxic materials and examples.

- I feel that the Park Service has [not] recognized the coexistence of cultural and natural resources within any park and this is a very important hurdle to get over. For example, this questionnaire is focused upon natural resources, but at this park unit where cultural resources are emphasized, we do not have a strong justification or support to develop natural resource programs. With the present funding level and park interpretive staff, we seldom have the luxury and opportunity to concentrate on developing and presenting natural resource programs, although we realize the problem is nationwide. We have many good ideas for a variety of interpretive programs, waysides, publications/brochures, but unless we either receive an increase to our budget/staffing or special funding (i.e., parks as classrooms, etc.), they will only remain ideas and never become reality (at least in the near future). In the same respect, we have sought outside assistance via friends' groups and cooperative associations, and this type of partnerships will definitely improve our interpretive programs and tide us over these bleak years when funding is hard to come by.

- Some ideas:

  1. Incorporate resource management issues in park-sponsored media (e.g., park newspapers, site bulletins, films, videos, exhibits).

  2. Develop exhibits for county fairs near parks.

  3. Encourage national media such as PBS to feature resource management issues.

4. Expand environmental education programs to include resource management issues; develop teachers' guides to park areas.

5. Increase interpretation of resource management issues in personal service programs.

6. Develop field seminars that provide in-depth interpretation of resource management issues.

7. Recognize the importance of interpretation as the communications arm of the National Park Service and provide adequate funding and FTEs for that purpose.

- In all honesty I have no ideas on what measures should be taken to improve the interpretation of natural resource issues. I have been at this historic site for 16 years and we deal exclusively with historic/cultural interpretation. The only thing I can offer is a media campaign similar to "Take Pride," where these significant issues can be placed in the public eye for long periods of time. An honest effort on good quality waysides and museum exhibits wouldn't hurt!

- We need guidance at the national level to identify those issues that are of the most concern so that we can prioritize our efforts and allot the necessary resources to those with highest priority.

- Interpretive managers should demonstrate a proactive role in communicating the park story (in all its grandeur and complexity) to the visiting public. This very much includes discussions of the systems, diversity, problems, and issues as they relate to the park resources. The public should know the significance of the resources and how they interrelate. We need to discuss with them how they are managed and explain the whys. My experience has shown that using your creativity, you can share all aspects of complex systems, and still provide the visitor with thought-provoking programs that capture their attention. Visitors can learn and enjoy themselves at the same time. We should say goodbye to the programs that just highlight pretty pictures and list park resources. Naming has its place but programs should do far more.

- I think a realization by all parties that if our public does not support resource policies and understand the issues, then we could lose the whole ball of wax. The National Park Service, in many cases, considers interpretation a frill.

- Interpreters (managers and supervisors) need to insist on being included in development of all plans to ensure they know the rationale for decisions as well as offering their knowledge of natural history, our publics, and communication techniques. Training by researchers should also be a condition of research permits/contract researchers.

- There needs to be significantly more outreach to surrounding communities from grade school on up and including special interest groups.

- At sites where history is the main interpretive theme, it is imperative to adequately address the main historical themes. The Santa Monica Mountains NRA has wonderful natural resource and interpretive/environmental education programs on aquatic ecology, air quality/visibility, and forest ecology. Currently we do not have adequate staffing to address secondary themes, nor funding to produce publications.

- Broader exposure through non-personal programming. Limited funds make this the most efficient means of delivering interpretation messages.

- Administrators need to understand the role and function of interpretation. Because it can interact differently with the visitor and public than other National Park Service operations it has to be dealt with differently. We still tend to think that interpretation is the directing or telling phase of our natural/cultural resource management process. As long as we continue to perform in this manner the public will not be involved, not be part of the process and we will continue to only "preach to the choir."

- Identify the whole situation, and then work backwards. We in the federal government could not survive private enterprise. The downsizing that Proctor and Gamble is currently undergoing probably should be done in the National Park Service. Projects like the Man in the Biosphere (in my opinion--at least at Ozark) are going nowhere. This is the age of information--we have to first have a vision and then decide what we need to use and what we do not. But first we have to identify the whole picture and then use only those parts that are critical, less critical, and so forth. Interpretation (education) is very critical, yet we never get around to implementing it--it should be one of the first things because in order for people to understand where we are coming from (and what we believe is important), we have to understand where they are coming from. If we really cared about our natural resources, we have to first care about our neighbor! The one that we talk with so they can be empowered and understand. They are part (a very big part) of our resource dilemma. And in them lies the answer!

- In the parks I've worked at, there has been in the interpretive division a strong awareness of resource issues and an ongoing commitment to informing visitors about those issues. This commitment has been (and, I'm pretty sure, still is being) met through a combination of finding ways in all interpretive programs to make resource issue connections, presenting a few programs (perhaps 5-10% of total programs offered) addressing such issues directly, and including issue-oriented articles in park newspapers (10-30% of space).

- We need a good mix, but should not be afraid to address sensitive issues (as long as we have good information). I think the public is going to expect more from us than show-n-tell. On the other hand, shifting the interpretive emphasis towards more issue-oriented programs at the expense of traditional interpretive programs would not only ensure fewer visitors at ranger activities (since interest in these programs is rarely as high), but it would rob visitors of opportunities for gaining insights and appreciation of the resources for the enjoyment of which the parks exist.

- Resource issues in parks are as common as the trees, birds, and scenic beauty people come to admire. In this day and age we owe it not only to the public (as the educators of the National Park Service) but to the flora and fauna we delight in to communicate the issues clearly, truthfully, objectively.

- I would like to see interpreters mention issues in their programs at whatever level they feel comfortable with. The bridge person between resource management and interpretation can help to link new interpreters with the information they need. I'm not talking about making people feel uncomfortable, but informing them. After all, what is happening in the parks is most likely happening in some participant's backyard. Also, environmental education school programs are great places to include the issues on a more basic level.

- Management needs to support interpretation of all resources.

- Expand the focus from safer, general interest/identification of natural items to include strong and positive topics dealing with current and/or anticipated resource threats and impacts and their possible management solutions.

- In general, Servicewide re-invigoration of interpretive services is necessary. While there are relatively isolated examples of successful interpretive operations that clearly serve as the informational and public relations link between contemporary resource issues facing parks and their visitors, more attention is needed. Specifically, the objectives upon which interpretive operations are based need to be revisited to accomplish two changes. First, to discriminate between interpretive objectives and the corresponding goals derived from them. In many instances goals are listed as objectives. The resulting objectives (goals) tend to achievable on an annual basis, directing interpretive operations to short-term, annual programs which tend to isolate this key park function from the long-term needs of park management. Second, the linkage between the issues in a park's resource management plan and statement for interpretation (or corresponding guiding document for park interpretive operations) must be forged within the context of the park management objectives for which both documents are strategic action plans. The resource management plan and statement for interpretation, functioning within the context of the park's management objectives, must be brought to "mirror" and support one another. Specifically, a priority resource management issue for which there is little or no information available should include as a component of the resource management action the acquisition of needed data concerning the issue and provision for the delivery of a briefing/background document designed for use by the park interpretive operation. The corresponding statement for interpretation element should identify the method or media that would be used in communicating the issue to the visitor and surrounding communities. In short, interpretation, like all park operations, must be prepared to function as an essential action arm of park management and evolve beyond its traditional role, which has focused almost exclusively on the visitor experience. Interpretation is not "extra"; it goes to the critical relationship between the preservation of park resources through management programs and public understanding and support of the National Park Service. Park specifically, at the Natchez Trace Parkway

the scope of the park's previous interpretive program has been significantly and adversely impacted by reductions in available funding. As inflation, replacement of CSRS employees with FERS hires, and other costs have escalated, the primary cost elements of interpretation, personal services, has been progressively eroded. The most effective communications tool of basic interpretive operations, front-line interpreters, has declined to the point that the park is just capable of keeping its visitor information facilities staffed.

- Interpretation must obtain equal standing with resource management and law enforcement as a congressionally-mandated division. Until then, interpretive training, programs, and personnel will continue to fall in third place in National Park Service mainstream management.

- The National Park Service needs to stop separating out natural and cultural resources. This survey could easily have included cultural resources as well. Issues such as grazing, acid rain, and air quality effect our cultural resources as well.

- Probably the largest problem encountered in interpreting natural resource issues resides in lack of progress on the ground. Much of government, certainly several agencies, are being pilloried over pursuing courses that are adverse to natural resources or don't contribute to problem solving. The National Park Service is not immune to criticism and doesn't have many outstanding examples of progress. There is too much pointing out of problems and not enough outlining of solutions. Trimming back personnel and funding impairs natural resource interpretation because the most effective way of handling resource issues is through personal services. No amount of exhibits, videos, and publications can make up for directly dealing with these mostly controversial matters on site with highly-trained interpreters. When resource matters are interpreted at the site where solutions are being sought visitors are much more impressed than when a general or academic approach is taken.

- Both on-site and off-site school programs need to be expanded, made more practical, and be done in-depth.

- Present levels are understaffed: need expansion. Interpretation of natural resource issues are too linked to other interpretive issues: separate.

- Park managers should allow more latitude to interpret natural resource issues even in historic areas.

- Resource interpretation a National Park Systemwide or regional thrust for a year--like Columbus Quincentennial.

- In most parks today, we are very lucky to be able to present each of a variety of subjects at a single level of detail pitched to the comprehension level of a single educational stratum. Sales publications are sometimes the only exception. Not only do

we need to increase the supply of what we presently are providing, we need to broaden the range of what we supply.

- Interpreters are frontline visitor servers. Researchers are frontline resource information gatherers.

- Each park needs a resource interpretive projects group that can produce professional interpretive media quickly.

- Get our facts to the public first so they understand what we know and why we are doing something.

- Target interpretation at the "problem" public.

- Present resource education (environmental education) to the future park users, kids. Further explanation of this suggestion:

  1. The superintendent, resource management specialist, researcher, law enforcement rangers, and chief of interpretation need to work as a team. The superintendent can lead, get funding, and set policy. The researcher can gather and interpret the data so the resource manager knows what management strategies to follow. The law enforcement people can stop behavior that is damaging to the resource. The interpreter can help all four by building public support and clarifying visitors' values toward the resource and its use. A resource project that does not include interpretation as part of the project plan is an incomplete effort. Taxpayers shell out a lot of money supporting research and management. They have a right to know why the money is needed and what it will benefit. These same taxpayers come and impact the resource. They need to be persuaded to interact with the resource in low-impact ways. Unless interpretation is included from start to finish, the interpretation will be less effective and the resource may be compromised in the long run despite the best efforts of resource management and the researcher.

  2. Lots of money for more summer seasonal interpreters to present walks and talks is not the whole answer. Less than 10% of our visitors attend ranger-led interpretive programs. What I could use most are three permanent positions. One would be a creative writer/editor position who knows how to use a desktop publishing system. The second would be an artist/photographer who can illustrate anything in a style that is distinctive. The third is a special projects person who is creative, a planner, has media skills, is flexible with broad interests, to tackle resource public relations initiatives. I am trying to do these three jobs by myself at present. What I need most is creative professional help that can provide me quick, proactive capabilities to tell our side of the story, to get our facts out first, before the opposition ever gets organized. I think each park needs this capability and boldness.

  3. We need better information sharing. I think the most effective way is face-to-face. Reading publications is fine, but talking it over, asking questions, reviewing and re-

vising interpretive text over and over again is invaluable. Resource managers and researchers need to stop, take a breath, sit down with the interpreter and talk. Hash the information out, share ideas and inspiration, brainstorm, work on it together. But, in the end, trust the interpreter's instincts and experience as to what the visitor can understand and is willing to absorb.

4. We need a new attitude. Rather than conducting a religious jihad, we need to present the facts, ask questions of the visitor that provokes new thoughts, and let them make up their own mind. If we convert them, great! But if all we do is get our side of the story to the public clearly and concisely so they understand our position, we have done an honorable job.

5. A shotgun approach to resource management interpretation, where we develop a program and show it to as many people who come to it, is not the most effective way to get the message out. If a park has a problem with grazing, they should fund a program that deals with the research, management, and compliance aspects. Then identify the public that needs to hear the message, namely the livestock growers in the area. Take the program to the cattlemen's association, the farm bureau, local meetings where ranchers are invited to attend. Present the facts and get our message to them. Then listen to them and have an open dialogue with them. The main thing, however, is that they understand our position, our mandates. They may not agree, but at least they would understand and some of the misinformation might be alleviated.

6. Youngsters throughout America will be our clients in 10 to 20 years and beyond. They will have rifles, traps, axes, mountain bikes, fireworks, matches, spray paint, ATVs, and on and on. They need to be reached now, while they are impressionable. If we can provide them with a basic understanding of how ecosystems operate, instill an appreciation for park values, and provide an introduction to resource management, they will be respectful users of our parks in the future. This is, in my opinion, the best way to achieve our resource management objectives over the long haul.

- Hold a Servicewide chiefs of interpretation workshop/seminar on addressing ways to incorporate interpretation into natural and cultural issues. Invite all the chiefs of interpretation from each park to develop ways of making interpretation an integral part of the Organic Act and the parks' enabling legislation. Have interpretation as part of the "compliance" process for approving natural resource stickers, management activities, and research.

- This is a cultural area with limited natural resources. We are small and have few funds to interpret our cultural resources let alone natural resource issues of limited scope. The most important thing to us would be to link cultural landscapes to natural resource issues. To date, I see little connection being made.

- As for improving the interpretation of natural resources, I suggest we stop spreading ourselves so thin. Do it where it is important and stop trying to do it where visitors don't expect it or come for it. Even though we have issues related to natural resources--who doesn't--they are minuscule when compared to other parks having large acres of land and vast natural resources.

- Mandate all parks provide at least a program or exhibit on natural resources.

- A less restrictive interpretation of the enabling legislation of parks that fall outside the traditional park image--specifically, the cultural and historical sites need a bit more "freedom" if they are to provide opportunities for natural resource interpretation.

- Natural resources in many parks are not being interpreted to their full potential.

- Natural resource-related interpretive brochures.

- More interpreters.

- Instead of printing Unigrid brochures we don't need or want ("Parks as Classrooms" was marginally useful; "Endangered Fish," not at all; "Insects," very limited; etc.). With some staff, we could address this issue very well including the "Parks as Classrooms" type interpretation.

- The National Park Service is unwilling to take on hard issues. Too worried about offending someone or some group. Seldom tries new approaches that involve any risk. Still more interested in putting out bland information than in getting the visitors' attention by hitting them between the eyes.

- Knock off the hot issue-of-the-year-program. Need more support developing broad-based programs rather than the "year of air quality" or the "year of biodiversity."

- Need to look outside the National Park Service to what's happening elsewhere in the interpretation of these issues; the National Park Service is too in-bred. Spend some bucks and hire a few experts.

- The freedom for interpreters to discuss critical issues. Some managers put on too many side boards strapping interpreters' ability to discuss controversial issues.

- The resource issues are not always that clear cut. Even scientists disagree on resource management issues. How do interpreters discuss such issues if the interpretation of the facts are unclear?

- Management should make it a priority if it is important.

- We suggest that ways be found to help managers recognize the vital role interpretation plays in communicating natural resource issues. It may take demonstrating to them

how effectively public support can be obtained when interpretation gets involved in the planning phase of resource management projects. The re-introduction of the red wolf to the Smokies is a good example of involving management, public affairs, and interpretation in the strategic planning phase. In this way the resource management plans were tied to a communication strategy so the groundwork was done prior to the re-introduction of the red wolf. This proactive approach to management and communication/education can go a long way to ensure natural resource issues are effectively communicated so that public support is fostered. Everyone concurs on the target audiences, messages, and communication mediums and can work together with direction and purpose. The next step is to provide interpretation with the personnel and funding to do the job. This is more likely to come when management has success stories to consider.

- Develop canned programs (quality) that could be used nationwide to address general topics such as the mission of the National Park Service, natural resource issues, cultural resource issues, career in the National Park Service, etc.

- Interpretation needs direction and support of overhead/interpretive gurus to take on challenges of controversial issues such as degradation of resources from outside sources and development of adjacent properties. These issues are often controversial (obviously) and superintendents and regional directors are not willing to take an adversarial position--understandable in a bureaucracy, yet, for some areas, especially small parks, these issues are the major threat to the park's integrity. Let's not be all things to all people, but emphasize our job/mission and tackle some unpopular issues, including interpretive and resource management concerns.

- More extensive use of community outreach/environmental education programs to carry this message to the public. Both on a local and national scale.

- Interpretation cannot do this without management support and funding and staffing resources. We don't have the ability to cover visitor information and park orientation stations and tell the basic park story identified in the legislation. Dealing effectively with resource management issues is below the "bottom line" even if we make it priority #1B.

- Need a National Park Service theme for the Park Service that is the key to tie all National Park Service areas, together--like fire has "Smokey Bear" and Forest Service has "land of many uses."

- This question seems biased in my opinion. Is the task force presuming that National Park Service interpretation is not adequate? If so, what specifically are the deficiencies and is there any information to document deficiencies?

- Gain consensus among park managers about the importance of interpreting critical natural resource issues.

- How about a packaged National Park Service directive from the Washington Office, similar to the 1992 fishing initiatives, that can be instituted in the parks?

- Additional interpretive personnel, especially during visitor seasons. CPSU research and personal experience revealed the presence of a uniformed interpreter at high density visitor areas (and elsewhere) is a substantial deterrent to resource degrading activity. Informal interpretation (roving interpretation) in these settings is highly effective and well-received by the vast majority of visitors. The key is sufficient personnel to present a notable presence, especially during time of peak visitor use and periods when resources are particularly subject to degradation.

- Interpretive focus on foreign language-speaking visitors. CPSU research and personal observation revealed visitors from countries and/or cultures can cause a disproportionate amount of resource degradation. A busload of foreign visitors who trample a subalpine meadow or a family of foreign culture who picnic on a blanket spread on a subalpine meadow do substantially more damage than a few isolated off-trail users. Again, intense roving interpretation-compiled with information in a variety of languages--is an effective deterrent. Interpretation in this case need to be a focus of entrance station rangers who spot diverse cultural visitors and distribute information before resource impacts occur.

- Parks with similar issues should be given regional office support in developing interpretive media--brochures, waysides, traveling exhibits--to interpret common issues (e.g., whitetail deer problems, etc.).

- The interpretation of natural resource issues in the National Park Service should be tailored to meet the needs of individual parks. Each park does not need to produce the same level of natural resource interpretation. For example, one should not expect the same level of natural resource interpretation in a cultural area as in a natural area. One should expect the same degree of concern for the health of the park and it's resources, but that is an issue of park management rather than interpretation. Interpretation of park resources must be linked to the purpose of the park and the significance of the resources it is charged with preserving, protecting, and interpreting. Toward this end natural resource managers and specialists can provide interpreters with information regarding specific park resources and resource management concerns. Park interpreters can then use that information to provide natural resource interpretation on a level with the significance of those resources--with the range of options extending from full-fledged programs to providing literature to inquiring visitors.

- Develop flora and fauna site bulletins that address "unusual" natural resources. Provide packages or programs when needed. Have some canned programs on the shelf (e.g., fire ecology, wildflowers, T&E species, birds, etc.). Address paleobotany as if it relates to today's floristic characteristics.

- The smaller the interpretive staff and funding, the less time and media interacting with visitors; thus the available time and media is primarily dedicated to the interpretation

of primary themes, and this interpretation must maintain a certain quality rather than quantity, with limited funds and staff. A percentage of time is spent on secondary interpretive themes.

- Stress the importance of interpretation and a positive proactive approach that resource management types should take toward it.

Comments on Questions 10 and 11, Natural Resource Issue Interpretation Questionnaire

Responses to Question 11: Is there anything else you would like to tell us about interpreting natural resource issues at your park or in the National Park System?

Training

- At Homestead, resource management personnel and interpretive personnel frequently interact to exchange ideas. Cross training is used to ensure the two programs work together, thus improving both resource and interpretive operations.

- Interpreting these issues can be very "sticky," especially if the issue is a result of an external park stimuli such as commercial development or industry. Interpreters can, and often are, used as the frontline ambassadors and diplomats when dealing with these issues. In my opinion, properly trained and issue-educated interpreters can help to resolve these issues via positive public educational and interpretive programs. This could be a very strong arguing point for establishing a formal natural resource issue training program for interpreters. After all, it is the job of the interpreter to educate the public and to help win support for park management strategies via positive influence.

- Supply the interpreter with as much information and training as it requires to do the job needed. Training takes money and time, but the results are generally worth the effort.

Funding

- There is a lot of potential at Organ Pipe, if only funding was available.

- There are many issues which should be interpreted but reduced budgets and staff will not allow this to take place. However, many resource issues, both natural and cultural, are interpreted by means of walks and talks, wayside exhibits, visitor center exhibits and dioramas, articles in the quarterly newspaper and free brochures developed especially for Point Reyes.
- Because of the overall funding problem throughout the National Park System, interpretation in many cases must take a lower priority (i.e., 1) safety and public health; 2) maintenance of facilities; 3) resource protection; 4) interpretation).

- I would love to be focusing my attention on it, but in difficult budget times, basic information services and the miscellaneous other duties interpreters have eats tremendously into interpretive programs. In this park we are at the point where the best interpreters are trying to leave, to go some place where they can interpret.

- We have extremely limited staff and funds for interpretation. It has not received much emphasis from park management, ever.

- Recruitment of personnel has changed drastically and funding for interpretation has been cut to provide more maintenance funds. Cumberland Gap is a historical park.

- We have a funding request in resource management plan for interpreting natural resource management.

- This a cultural/historic resource park, but it has very significant natural resources. Over 5,000 acres of the park is salt marsh and provides habitat for a wide variety of animal and plant species. Due to limited funding for personnel, the interpretive program must focus on the primary cultural resources as mandated in legislation. An expansion of natural resource interpretation would be welcome, but would be dependent upon funding. It is difficult enough at present to provide minimal interpretive services which relate to our historic resources.

- As a historic site, I feel we are more active in interpreting natural resources than other similar sites. We have the capability to do much more if we had the necessary funding and staffing at Saugus Iron Works National Historic Site.

- We could and would do a whole lot more if we had adequate funding/staffing levels. Seasonal staffing is, for example, only half of what it was in the 1970s. Interpretive budget is only half of what is needed for adequate programs. As result of shortfalls, we can't even keep visitor centers open or roving interpreters about at needed levels, let alone perform adequate resource issues interpretation.

- The natural resources in Alaska are almost unbelievable--they are that impressive. Yet, we receive almost nothing to interpret them (most park interpretation budgets up here are less than 5% of the park's budget). For example, Katmai was severely impacted by the Exxon Valdez oil spill, but we received no funding to educate the public, and in fact we were left out of much of the discussion because of our relative isolation. Field interpreters need to mix more with regional and park resource managers.

- The Alaska parks have serious issues that beg interpretation. Because visitation is comparatively low, serious attention and funding hasn't been given to interpretation in Alaska's park lands. Mining, ATVs, private land in park boundaries, development of roads, airstrips, visitor and hunting facilities within park boundaries, backcountry management (or lack there of) subsistence interpretation, checker board land status--these are issues that demand interpretation to visitors, especially to locals (who don't know what they've got 'til it's gone), and to arm chair travelers throughout the world.

- It seems as though our critics, internally and externally, keep suggesting that efforts to letting the public know of the Service's resource issue is critical. Yet, the education initiative, parks as classrooms, has died, again, from lack of financial support. When will this inconsistency be resolved?

- All any park needs is the money for staff and supplies.

- Morristown is interpreting primarily for its cultural resources. Funding is critical to providing a means to interpret the natural resources through personnel (staffing) and training.

Staffing

- It can be very exciting, but we are limited by staffing, and we burn out in summer dealing with 6,000 people a day at our visitor center--which is a BOR visitor center that tells story of the dam. We have a new visitor center at Bullfrog, but many fewer people visit there.

- Lack of permanent staff is by far our greatest obstacle to interpreting natural resources. Even though our's is an urban park with primarily cultural themes, we have many opportunities to interpret natural resources but no one to take advantage of them. It is a real loss!

- Gates of the Arctic has a budget of nearly $1 million and a staff of 12 permanent, but no position dedicated solely to interpretation. At the local end, we need funding/staffing to produce curriculum relating to local issues, broaden interpretation outreach, and we need space for interpretation and visitor contact. Also need funding for interpretation displays.

- With a limited staff (size) it is difficult to formally interpret most of the resource issues. Most of the interpretation on resource issues is very informal and varies from day to day (the topics).

- Improve interpretive staffing, qualification and training opportunities. Provide training "details" for interpretive staff to resource management division.

- Basic day-to-day operation consumes all staff time. Six rangers manage 2.2 million visitors annually--no seasonals, no support from management for core interpretation.

- We need to be doing it, but we only have staff to do strict interpretation of battle story and we need more skilled personnel to do a good job with natural resource issues.

- Resource interpretation is stretched in Florida District because of the demands and needs of both cultural and natural resources in relation to the staffing available.

- I have a number of concerns about how the National Park Service does business, and suggestions. I do not believe the National Park Service has the courage, focus, or true commitment to make needed changes to fulfill our 1916 mandate. The main problem, in my opinion, is that we as an agency have lost sight of our fundamental mission as articulated in the Organic Act. We are too caught up in "process," special initiatives, and

other mandates; this leaves fewer resources (people and funding) to accomplish what Congress intended us to do.

- Currently eight permanent interpreters in area that receives 3.6 million people; only six seasonals.

- Only that I have seen a steady erosion in the accuracy of resource-oriented interpretation. This is related to inadequate training and diminishment in staff time devoted to program research. Field interpreters survey about trying to keep pace with a multitude of duties (which is a direct result of staffing shortages) that has reduced preparation time for even the most basic programs. As a result, the depth of information related to resource issues diminishes as well. This observation is based mainly on my current park experience and therefore may not extend Servicewide.

- Resource interpretation is one of our most important responsibilities to support management and the National Park Service. Staff limitations (numbers, education, and interest) are the greatest handicap we have. Not only must we have more staff, but better educated staff in the right fields so they will have the natural inclination to understand and interpret our resources and issues. The National Park Service at highest level must support this if we are to do anything more than a mediocre job! We need to stop hiring computer science, business, and english majors to interpret natural and cultural resources!

- At my park there aren't enough interpreters to interpret the main interpretation theme. Therefore, the natural resource issues don't have a chance when the primary theme is not adequately interpreted!

Information Needs

- We need to take time to meet with resource management division on a regular basis. We tend to blitz everyone at seasonal training with information, but fail to keep the communication flowing during the rest of the year. Resource sessions during the off-season are helpful. A monthly one-page summary might also be helpful. The difficulty as stated many times already is lack of personnel. We are all so busy with day-to-day operations that it becomes difficult to take on more projects. Periodic articles in local newspapers also help keep the public up-to-date and could be provided by the public information specialist (if we had one). As we address more resource issues we need to spend more thoughtful time in discussing/exploring with staff interpretive techniques that may be useful in presenting information.

- Share interpretive resources between parks that are close.

- Need more information on prairies along with Harpers Ferry type displays on natural resources.

- Hawaii Volcanoes is a relatively new unit with few of its planning documents complete, e.g., no general management plan, interpretive prospectus, or resource management plan.

- At this park, a lack of complete baseline data (plant, animal inventories, habitats, endangered species) make it difficult to effectively interpret issues related to them.

- We need to increase our capability to share relevant information, ideas, methods, and enhance information retrieval systems, which will help us avoid duplication and "reinventing the wheel." We need to have better sharing mechanisms in place to interface with other federal, state, and local agencies, and educational institutions trying to do the same thing and/or that have relevant information, ideas, tools, or methods to share.

- The park has both a division of science and resource management and a division of interpretation and cultural resources. Science provides information useful to the interpreters, interpreters help set the direction of scientific inquiry, and dissemination of research results.

- Often natural resource subject matter experts have access or knowledge about subjects such as neo-tropical migratory birds or Africanized honeybees (including professionally-produced slide programs), but interpretive staff are often unaware of these resources. Cultural parks often "miss the boat" on natural resource issues because of a lack of natural resource expertise at the park level. Interpretive workshops can help, such as the one I attended on air quality in the Southwest Region or Africanized honeybees with Texas A&M University.

- Increased communication between natural resource management specialist and professional interpretive staff.

Interpreting Natural Resource Issues in Cultural/Historic Park Areas

- Historical interpretation is primary at this park. Attaining the necessary basic level and reaching the park visitor with this primary message leaves little else for natural resource interpretation. Issues have to be addressed in secondary methods, i.e., publications, special exhibits, and as part of other cultural resource programs.

- As long as we continue to segregate natural resource management from cultural resource management, we diminish both.

- The natural beauty and setting of the park is admired by all visitors and is in itself a draw for many visitors, especially return visitors, but it is the historical interpretation of the park that visitors seem to expect and want and thus could make it awkward to do natural resource issues interpretation.

- I would like to see more course instruction on interpreting tough resource management issues and how to incorporate this interpretation into programs that focus on specific historic and cultural themes.

- The inter-relationship between natural resource subjects has largely been accepted by park management throughout the National Park Service. However, the inter-relationship between natural, cultural, historical, and recreational resources has not been as fully accepted or supported. There may be one primary resource type due to the enabling legislation, but the National Park Service has to manage all park resources. This should be easy to incorporate into the charge set out in the enabling legislation since these resource types are closely tied into one another. Natural processes affect cultural sites and cultural sites are influenced by natural processes. Pigeonholing, stating that natural parks do not contain natural resources, is a stumbling block to effective management and interpretation needed to deal with current park issues. Continue providing funding and personnel support to address these concerns. Teamwork, cooperation among different park units, as well as inter-divisional park cooperation, towards the "biodiversity" ethic is encouraged as well.

- Due to limited personnel at the park level, interpretation in a historical park is usually focused on history of the unit or park purpose/mandate. Unfortunately, interpretation of natural resource issues ends up taking a back seat to what is physically possible due to shortage of staff/personnel. Natural resource issues are of equal importance. Perhaps a team can be brought together to offer training for interpretive staff members. For example, the Western Regional Interpretive Skills Team. However, due to budget cuts and constraints, even this training is limited. We could sure use help out here. World War II had a profound affect on Guam's natural environment and little is known or researched on this matter.

- We could improve in our interpretation of natural resources by making the link between natural resources and the impact they had on soldiers during the battle fought here.

- We are basically a historic site. There is some interest in interpreting some of the historic plantings around the White House. We are able to meet those needs, but most of our interpretive programs are historic oriented.

- We manage the natural resources as a means to protect the cultural areas. We interpret the cultural resources as they related to the events of the Civil War. On the whole the cultural resources are what the visitors come to see and learn about.

- Although there are a few natural resource issues that we could interpret, our limited time and funding focuses on our primary park themes that are historical in nature. Again that doesn't mean we can't periodically have special programs on resource issues, just have to set priorities.

- With park resources comprising mainly historic structures and the related historic scene, it is difficult to remain within parameters of core themes and goals when interpreting natural resource issues. Proximity of two large natural National Park Service areas within the geographical region limits need and viability of extensive natural resource interpretation at this small historic site.

- Our park is a national historical park and so natural resource issues will always be secondary in interpretation thrust. The new areas added to the park contain outstanding natural resources that will be interpreted as areas are open. We don't have the research done yet.

- Natural resources are often ignored in "cultural parks."

- Cultural and natural resources should be integrated in issue interpretation. Our natural resources are in their present state as a result of our history.

- This is a historical and presidential park. Much legislation was passed during the president's terms in office regarding environmental issues. The staff needs to take advantage of both historical and environmental information to present a full spectrum program.

- Currently historical and cultural landscapes are managed under natural resource management guidelines. This is impossible to do effectively. Separate guidelines should be developed and implemented.

- The interpretive program at the Adams NHS does include programs on the cultural landscape--including landscape features. Although traditionally historic themes have been limited to interpretation within structures, this is not the case at Adams NHS. Making the connections between "man and the environment," the Adams and their natural environment is a substantial part of the interpretive tour program.

- Fort Laramie is primarily a historic area and our limited interpretive resources are focused on historical interpretation. Our new master plan does call for the development of a self-guided nature trail sometime in the future.

- Interpreting natural resource issues at Wolf Trap Farm Park is a low priority relative to our mission of interpreting performing arts.

Interpreting Natural Resource Issues

- This is so important--lets get directives and support from WASO on down!

- Developing and presenting seminars dealing with specific natural resource issues may be helpful.

- I am enclosing an outline for an environmental education pilot program funded by the National Park Foundation and the National Environmental Education Training Foundation (NEETF). Actual work on this curriculum has only been during the last couple of months. Because of this, NPF and NEETF have not seen this tentative outline or any of the results of a pre-pilot implementation of this program. Having just experienced the pre-pilot program, I strongly feel that this is one of the answers. The only problem is I don't know where the agency commitment will come from, because if most supervisors are like mine the only thing they want is an end product--yesterday. To make them look good! I guess this is really where the Service should start. Follow P & G. I have enclosed a copy of the ongoing projects within the Division of interpretation and cultural resources at Ozark. Here you can see the involvement (or lack) of field personnel (at the park level) with resource management. Training of seasonals and program preparation, auditing, etc. is only treated lightly. Having a budget which only spends nine cents per visitor is ridiculous! Good luck.

- We do what we call critical issues interpretation at Great Smokies on re-introductions, exotics, endangered species, air quality, cultural resources, etc., and we believe we have a lot to offer and to share. We would like to invite your group to see and hear about our programs. We have developed some very exciting educational programs and we have another that has been underway for over a year on thematic units that we believe is the best in the nation. The curriculum materials we are developing are very exciting and we shouldn't forget this medium when addressing critical issues. We are integrating the park's concerns and issues into the curriculum, as appropriate. Our park would be an excellent place to have training on critical issues interpretation and education because we can bring in teachers and show real-life examples. Pardon the bragging but I am proud of the staff here. Interpretation nationwide needs to be addressed and not only on the natural resource side of the ledger. This may be more than you wanted and not focused on the question but I do hope it will help. Funding and staffing is our biggest need and this is related to many things. Parks are year-round operations and we have more reporting requirements, special programs, etc., that draw staff away from their primary interpretive duties. The community is demanding more from us. In our region, for example, we have many wilderness weekends, trout festivals, Earth Day activities and we always get more requests than we can handle. To solve this we recommend establishing a programming and budgeting process for interpretation. This process, if created, would list all the interpretive needs in the Park Service so they could systematically be solved, in priority. It would also provide an ongoing list of what is needed in interpretation. Except for occasional surveys we do not know all of our needs, priorities, what has been solved from year to year, what funds are needed for special initiatives, etc. The following is one example of the need for staffing. The Southeast Region hosted about 62 million visitors in 1991 and that was about 25% of the total visitation to the National Park System. There were about 700 SER employees involved in interpretation. This averages to about one interpreter for every 88,600 visitors. One interpreter cannot handle 88,600 visitors. Of the staff time only 19% was in conducted programs so the ratio of visitor/interpreter would be higher for the number of visitors contacted about our messages. Many sources believe interpretation is the key to a park experience. But, in a survey, 21 SER parks stated that they are operating

below a "minimum level of interpretive services." Interpretation is the outreach arm of the National Park Service and in the past we have helped establish the reputation of the Park Service. Environmental historian Al Runte said we cannot avoid controversial subjects. We added interpretation is to explain rather than merely describe. In the Everglades the interpretive program addresses the critical issues facing the park every day and it keeps the parks controversial issues before the public. The hallmark of the National Park Service has been the recognition of our interpretive programs by Congress and others. Interpreters, unknowingly to themselves and managers, have aided the National Park Service considerably and now that we have so many problems we do not have the staff to give programs. And this is one of our problems: that managers do not recognize the importance of interpretation and it should be the goal of this group to make sure they do. Robert Cahn writing in Earth Work stated, "No one holds the park manager accountable for the quality or quantity of a park's interpretive program; and it has no line item in the budget. A cutback in the hiring or training of interpreters can be, and usually is, the easiest cut for the manager to make. Reducing interpretation, however, may prove very costly in the long run. Generations of Americans have learned to value park areas through their personal encounters with interpreters. If a new crop of Americans can visit national park areas and not be helped to understand them as unique places...or for learning about our nation's natural and cultural heritage then parks may lose their specialness as well as public support in the 21st century." Cahn makes some very important points and with the recent emphasis on science and resource management it is now more important than ever before to make sure interpretation gets the message to the public. We must explain and excite people about our parks in a balanced way to gain their support and funding to protect their resources. Establish an interpretive management/supervisory training course that develops good supervisory and/or chief interpreters. This course should show how the interpreters should use the park's legislation, management, interpretive, and resource documents to develop critical issue interpretive programs. And with these, using the goals and objectives outlined, address the issues management and the National Park Service are facing through both personal and non-personal interpretive services. Many of the issues are regional and even nationwide in scope and we should take a global approach to developing interpretive programs, i.e., air quality, endangered or threatened turtles for seashore parks, etc. In a National Parks and Conservation Association survey they reported in the Nov./Dec. 1992 magazine that of a half million people surveyed, 96% support education efforts to alert today's children to tomorrow's park problems. The Parks as Classroom program is a good start but needs funding if it is to be successful. It also appears we do not have a concentrated program on curriculum development. Perhaps nationwide we should look at this. So many of us are spending our time and energy developing curriculum materials that all of us do not need to reinvent the wheel. We could share. The National Park Foundation is funding many educational activities and how is this integrating into the national effort? Are we presenting our important messages in these curriculum materials? We must involve our local, and other, school children in our interpretive programs. Interpretation/education is essential for protection. If the youth do not visit our parks when they are young then they will probably not as adults. The sixth grader who attends our programs today will be voting in six years. Our messages must be presented to the youth as they will be our future

users (and decision makers). Yet, from many, the viewpoint is that interpretation is discretionary. When you analyze most critical issues and decide who your target audiences are, many times park neighbors are more important than park visitors in affecting the issue. A variety of interpretive strategies must be used. Traditional walks, campfire talks, etc., must address the critical issues facing management. Interpreters must have the professional academic background to research and present these programs. We must go beyond this and the focus should be broader. Issues need to be analyzed so that everyone agrees on the target audiences that will help make a difference. Then, the most effective communication mediums can be selected. An effective outreach program including the media, schools and civic clubs, press releases, teacher workshops, off-site talks, curriculum guides may strengthen the local support parks will need for the present and the future. This type of effort will integrate nicely into the regular interpretive programming. Outreach efforts require staffing and we recognize nationally that we do not have the staff to respond to visitor needs in the park. Educational programming is very important to the National Park Service yet we can only fund seasonals for the busiest time of the season, usually summer, and parks do not have the staff in winter to present the all-important school programs. Again, we are missing our local audience. Yet parks are developing curriculum materials constantly with presumably few interpreters to present during the timeframe for when they are being developed! If the purpose is to utilize natural resource interpretation to improve the Service's ability to manager resources, a critical look at how we have traditionally done business is necessary. Times may have changed. The traditional way is our foundation and we should always retain elements of it. We may simply need to expand our interpretive vision. National Park Service interpreters should work with other agencies, as much as possible, to further their educational efforts. Many state and federal agencies can agree on selected topics from an educational perspective even when they don't agree from a management perspective. Partnerships can work. We salute your efforts with this survey and look forward to the finished product.

- The work of natural history interpreters in the National Park Service is hampered by the non-support of many National Park Service science and natural resource management people who over-estimate the knowledge and interest of visitors in research results and other arcane subjects. Planning and evaluation of interpretive media and services should be based on the visitors perspective(s), not those of Park Service professionals. Too many scientists believe that interpretation focused on fundamentals is beneath the National Park Service. Too many natural resource managers are interested only in interpretive presentations that can modify visitor behavior so as to protect resources. If this kind of effort fails, they hold the interpreter accountable. Other forms of interpretation they regard as a waste of stuff and money--a view held equally widely among maintenance managers. Maybe these attitudes prevail only in large, old-line, chronically under-funded parks--but somehow I doubt it.

- I would like to relate a program I am proud of. At our park, a good 80% to 90% of the backcountry use hours are logged by up to 11,000 river runners annually. They run private trips or hire a concession river company to take them. Trips are one to five days in length, with an average being about three days in length. River runners come in

contact with and experience a great variety of resources. Potentially, they can experience the impact of Flaming Gorge dam. These people adversely impact cultural sites in the river corridor, impact water quality, create a human waste management problem, create a refuse problem, cause soil compaction at camp sites, pioneer trails up canyons and across flood plains, along with other impacts. As extensive as their impact is, these people are the river corridor's potential salvation. River runners are the public that can come up with solutions to these impacts and can organize support for federal reserved water rights, or oppose construction of a dam. Realizing this, I diverted funds from traditional interpretive programs and established a river interpretive position. This person floated down the Green and Yampa Rivers and made every effort to contact each group he/she encountered. Sometimes contacts were informal and the ranger answered questions and when the opportunity presented itself, provided a quick impromptu discussion on a river corridor protection issue. Many times, the interpreter arranged to present a formal program to the group. On these occasions, low-impact camping techniques were discussed and the impact of dams on fluvial and riparian systems were detailed. As the interpreter built rapport with the group, he often lingered for several hours going from one issue to another as the interest of the group dictated. The last year of this program, 1988, we contacted 50% of the river users. It proved to me that taking our message to a target public, in this case the river users who created the impacts, proved the most cost-effective and provocative means of interpreting the resource issues of the river canyons. We clarified the values of river runners and educated them about the threats to the resources they were enjoying. Post-program evaluations indicated the program was achieving interpretive objectives and numerous comments indicated the program was popular.

- In my opinion, National Park Service interpretation lacks boldness. I don't mean a preaching kind of boldness. I mean a boldness in which the interpreter takes a personal risk and expresses new thoughts and feelings that he/she has. Exposes themselves, so to speak. There is a lack of creativity, an unwillingness to attempt difficult interpretive tasks. There is a lack of boldness in using color and different artistic styles and media. National Park Service interpretation has become predictable, it's in a rut.

- In general, the National Park Service has relied entirely too much upon personal services to communicate vital resource messages. Far too often publications, waysides, exhibits, and film have not been utilized. The basic park story has been developed in media, but resource management concerns or issues were left to the interpreters to "work" into their programs. We need to have these resource concerns become a more central message.

- Allow interpreters to speak freely about park issues--based on sound resource management and research data. Do not tell interpreters that their job is to solely entertain. Allow them to fulfill their mission of provoking the audience into action or thought. Protect the resource managers and interpreters from political interference that requires them to avoid answering questions about park issues for fear of repercussions. We are known throughout the world as "the conservation agency." The park's resources go beyond park boundaries, and our ideals are global. The National Park Service needs to

take a stronger stand on how outside influences affect park resources. These concerns should then be freely discussed with the public through any number of interpretive techniques based on the most current, up-to-date research data.

- I believe we need to tackle and explore the current and sometimes controversial issues that face our parks. While some areas do this more than others, often times we try to "avoid" the more difficult issues in an effort to continue good will. It is my belief and experience that today's visitor is ready to hear some of the important issues that are affecting our parks. Further, by providing the public with information and food for thought it may generate future support and understanding. Subjects that fit this category include the wolf, biodiversity, restoring the natural habitat, and buffer zones as some examples.

- Management at this park has been very positive about interpretation. Dealing with resource issues in the park, our instructions are to be proactive and accurate.

- Interpreting natural resources is so very basic to the mission of the National Park Service, yet it seems to have been lost in the last decade or so. I would much rather spend my time researching and developing programs that will enlighten the public about the resources, but that simply isn't possible in my present job. I think the National Park Service is losing as a result because I'm sure my situation isn't unique. If people don't know or understand the resource, they won't value it. A reasonably efficient clerical worker could do what I'm doing. Most of my time is taken up by scheduling, wading through the personnel quagmire, training VIPs and SCAs, squad meetings, access committee meetings, sign committee meetings, press releases, and evaluations. To prepare a new program, I have to do it on my own time, with largely my own resources, and precious little in the way of information. A good library (U of A) is simply out of reach. As a result we resort to "easy" topics with a superficial result.

- The National Park Service is a quiet agency among the many federal agencies in existence today. Our popularity with the public is largely due to the resources we are charged to protect. The National Park Service has never promoted itself or its resources publicly. Park concessionaires have done most of the advertising for us because we are the backdrop to their business. Visitation to all parks is growing at an unbelievable rate, yet the number of people the National Park Service contacts through personal and non-personal services is extremely small. The bulk of visitors to our parks are from urban areas. Many of them do not know who or what the National Park Service is. Even after they have gone through a number of parks they may not have even met one uniformed ranger. These same visitors are coming to national parks with preconceived idea and outdated notions of how they can utilize the parks. How often have park staff had difficulties with visitors or found resource damage in their areas because of careless, unthinking visitors? We in the National Park Service are fooling ourselves if we think we can educate these masses in the safe and enjoyable and nondestructive use of our parks when they drive up to our entrance stations. We don't have the staff or facilities to do it, and some visitors don't use the facilities or services already available. If the National Park Service is serious about "interpreting" and "educating" the public of the

park's natural and cultural resources, then it needs to be done before they get to the park. There are two ways to do this--in the schools and in the home. The "Parks as Classroom" program is an excellent start in getting future generations ready to protect our resources. In the second area--the home--the Park Service has done a poor job of educating visitors about parks and the Service. One way we can tap into this area is through television. Take note of the U.S. Forest Service and their many public service announcements--Smokey Bear, Woodsy Owl, and Hollywood actors extolling the Forest Service message that their lands are public lands managed for multiple use! How often have park rangers been identified by parents, kids, and even in the movies as the "Forest Ranger?" The Park Service needs to get involved in the same TV announcements! The Park Service should go beyond public service announcements, though, and get into prime-time television. There shouldn't be a National Park Service show, but instead the Service should get the producers, writers, and actors of popular TV shows to film in national parks with story lines geared toward educating the public on resource issues and environmental concerns. Think about how successful television sitcoms have been in educating the public on such issues as AIDS, drug abuse, anorexia, and on occasion the environment. In national park episodes the "Park Ranger" would not be made out as the not-so-intelligent security guard, and real park issues would be at the heart of the program. Why prime-time TV and not PBS? PBS specials are still important, but for the most part those people who watch PBS are already Park Service allies. They are not the ones we need to target our interpretive and educational efforts towards. This last point is obviously beyond what an individual park could handle, but even if sitcom television is never tapped, the TV medium is still one of the most powerful tools in reaching thousands of potential visitors!

- This is a critical issue we need to strive for. We need to continue to build support for National Park Service issues through the interpretive programs. It should not be left entirely to resource personnel, as technical information may not be utilized by a majority of visitors.

- Integrate GIS with interpretation. Use the application of GIS as an interpretive tool for the public.

- Virtually every major natural resource issue, be it on a national or planetary scale, relates to human overpopulation in some way. On a park level, more people = more pollution. More people = more over-crowding. More people = more long-lasting damage to resources. I believe we should be brave enough to limit visitation and interpret the destructive nature of overpopulation if we are to lead the nation or the world in care of our natural resources.

- Everglades National Park interpreters have the full support of management to aggressively interpret critical issues. Interpreters are full members of the National Park Service team to save the Everglades. No other park unit does a better job.

- The national park is being studied by the U.S. Army Corps of Engineers for possible construction of a tunnel under a mountain a few hundred feet from the hot springs. The

tunnel would require a 30′ diameter cut. It would be about 4,900′ long. The tunnel is for flood control, but will not handle all floods. This has potential to have the greatest impact on the park than any other human-made structure excavation since the early part of the 20th century.

- At this park the natural resource branch seems to be in the embryonic stages. Little information or coordination takes place between natural resource and interpretive services. There needs to be more natural resource studies completed on the park and staff needs to work more closely together. We need guidance and direction from regional resource management specialists on issues needing special interpretive emphasis and/or a resource management specialist assigned to the park. Presently, the interpretive staff addresses issues such as fire ants, control burns, etc., because they affect the daily activities, but this is done independently of the natural resource branch.

- The interpretation of natural resource issues is one of the most critical functions of the interpretive division. The responsibility for affecting public attitude and reaction rests on the frontline interpreter. Most visitor infractions are the result of ignorance and not general malice. We do not expect visitors to become subject matter experts after attending our programs. However, we hope that they will understand general environmental concepts and adjust their lives accordingly. Likewise, interpreters do not need to be experts in every subject matter they present. The general understanding that can be developed by working in concert with the resource management team will increase the likelihood that visitor attitudes can be positively developed by an enthusiastic, informed interpreter. Anything that stops short of the relevant education of interpreters is selling the system and the visitor short.

- Natural Resource issues need interpretation in all the parks. People don't realize what the parks are struggling with. They need to understand the issues. An effective way to present these issues is through interpretation.

- At Petrified Forest, the need for integration of resource management and interpretation is continually stressed, with special emphasis on fossil resource protection. Some specific steps include:

  1. The park's annual statement for interpretation will be signed off on by the resources management specialist or his acting.

  2. All other interpretive planning documents are "chopped," or signed off on by the resource management staff (interpretive prospectus, specific interpretive plans for waysides, museum exhibits, etc.).

  3. The park's integrated natural and cultural resource management plan is signed off on by the interpretive (as well as maintenance and protection) staff.

  4. All interpretive programs are subject to review by the resource management staff (including presentations, film, videos, publications, waysides, and museum exhibits).

- I feel strongly that any park with water should use a small aquarium to help interpret it. With a relatively small investment, and some space to assemble a group, interpreters can use an aquarium to great benefit on the subject of food chains and biodiversity, water quality, and the value of wetlands. The same interpretive concept would work for fresh or salt water habitats, but particularly for marine-oriented parks.

- I believe that, particularly with natural resource issues, it is far more important to hire interpreters who have a stronger academic background in the subject matter (biology, science, etc.) than in interpretive skills. Interpretive skills can be taught to most people, but the depth and breadth of knowledge required to validly and effectively educate the public on these issues far exceeds knowledge gained from on-the-job-experience and training.

- Servicewide initiatives too many times don't work. They should not be thrust upon parks that have to stretch to include it in programs. Be more selective (ask regional chiefs of interpretation) when looking for appropriate parks. Don't waste money for information that is never read or just goes on a shelf. Avoid "Year of (you name it)" campaigns.

- No interpreters prospectus since 1980.

- If we want informed and effective interpretation of natural resource issues, then we need to be willing to pay the price. Good interpretation takes time, resources, and skilled personnel. Interpretation is a profession and needs to be treated as one, rather than a catch-all for every odd program or emphasis that comes down the pike. We can't do it all and if we try, expect mediocrity.

- Do interpreters sit on your natural resource interpretation committee? I would be interested in participating in this important effort.

- The resources are also interpreted by means of the local media.

- Don't duplicate work that is done or can be done better by other agencies, non-profit groups, schools, etc. The National Park Service is not the only "game in town."

- Parks were created in belief that certain non-utilitarian values were more important than utilitarian ones. Human experiences = key; inspiration, education, recreation; so is protecting biodiversity and environment; resource management is necessary to permit other two. Interpretation should have same sequence of emphasis--in other words the utilitarian requirement can be overstressed; i.e., people do not come to Independence Hall to learn how to maintain a building, but to experience history. The same relationship applies to natural areas and natural history.

- The relationships between interpretation, law enforcement, and resource management are positive, supportive, and productive. The Seashore has been involved in several projects to increase the population of endangered species. Two of these projects,

restoration of southern bald eagles and the red wolf monitoring, have received much publicity. Not only is it important to train park staff and provide interpretive programs, it is also important to schedule press days for reporters and newscasters. News stories and news segments reach a greater number of local people than park programs. Evaluating projects and interpretive programs are essential and helpful. Education is considered the "keystone" of endangered species recovery programs. Determining the effectiveness of a red wolf education program at the Mississippi District was the subject of a survey using a sample population of elementary students. Students who attended the interpretive program scored higher on tests than those who did not.

- We are refocusing our AV Specialist position to enable us to bring "current events" resource interpretation to visitors via quick video productions projected via LCD video projector. We believe this approach will be especially useful in dealing with an ongoing series of glacial outburst floods that are impacting a popular backcountry location. It should also have positive value showing visitors current projects and relating the work to restoring adverse impacts to resource resulting from illegal visitor actions.

- This park tries to look at every possibility for interpreting resource management issues. Resource management issues are now receiving as much attention as visitor orientation and themerelated topics.

- It should be recognized that interpretation is a profession in itself. An interpreter need not be a scientist, and scientists are not necessarily interpreters. A biologist may be a great biologist, but a poor interpreter. Resource management must recognize the profession of interpretation and give credit to the know-how and expertise of people in that field.

- The quality and quantity varies depending on the communication skills and interests of the park interpretation/natural resource staffs. (Personalities affect programs).

- Merely giving "squirrels and nuts" natural history programs in the National Park Service no longer does much to achieve real management goals and objectives. World citizens face complex natural resource issues. National Park Service interpreters need to know what's going on inside the park and out; they need to be able to assimilate the scientific information and make it accessible and applicable to park constituents (not just those making an actual visit).

- It would make sense to form more partnerships or relationships in the surrounding communities, with scientific and environmental groups, historic societies, etc.

- An interpreter's "love" of his/her site/resources/visitors seems to be the only thing buttressing the interpretive profession in the National Park Service. Mandates, strong leadership, priorities, and budget allocations are nil or non-existent. "Word-of-mouth" interpretive support seems all that is left. Again, acknowledge the excellent job which is being done.

- The National Park Service has been criticized in the past, justifiably I think, for our efforts, actions, data, and management decisions relating to natural resources in parks. In more cases than not, we don't know what the resources and their condition are in our parks and make decisions based upon seat-of-the-pants guesses. Data collection has been sporadic, unorganized, and driven by the latest trend such as acid rain, the Yellowstone fires, global warming, and the like. In my parks we know very little about the natural resources within the boundaries. Information probably exists, compiled by other agencies and groups, and we are attempting to locate and inventory those documents through a funded resource management plan project statement. It is a start, more needs to be done. However, in the reality of park operations, especially a new developing area, there is more than enough to keep us all busy, including planning, facility rehabilitation, developing educational programs, new exhibits, all types of data collection, responding to reports, lands issues, external issues, and so forth, keeping in mind that all this must be fit in around what needs to be done on a day-to-day basis to keep the doors open. We like many parks do not have on staff either a natural or cultural resource management specialist. This is not stated as a complaint, only that we try to do the best we can with the resources that are available to us. Each of the parks have resource issues to be interpreted--although all parks do not usually share a common issue. To be effective the individual issues should be important enough to stand on their own and not just added as a tag onto every interpretive effort that the park presents, regardless of content. The effectiveness of an overall resource interpretation program in a particular park ultimately depends upon the value or importance placed upon it by the park manager and management team. Many times the park priorities are driven by the human and fiscal resources available. An effective program Servicewide will require some support to all field areas and not be just another justification writing contest.

- In smaller parks we would have more "quality time" to devote to natural resource interpretation if there were fewer surveys to fill out about national resource interpretation.

- Our park legislation and interpretive themes do not support a large active natural resource program.

- Yes, but I don't have adequate time!

- Substantial success with "Meadow Stomper" button campaign. At Mount Rainier, we have linked roving interpretation and other media with a button campaign. Two and a half inch diameter buttons with graphic and words "Don't Be A Meadow Stomper--Stay on Trails" has been very successful in deterring and reducing visitor impacts on high-density use subalpine meadows. Buttons are distributed via donation at visitor centers and in the field via roving interpretation particularly to visitors encountered off trails. Wearing the button has a positive effect on enticing people to stay on trails and its visibility extends the message to other visitors. The program is advertised through the park newspaper and via "rock cards" in multiple languages. Again, the key to its major

success is sufficient interpreters to rove the problem areas and trail heads "spreading the word."

- Many of the responses I gave for interpreting issues were based on infrequent programs, occasional articles in newspapers. Not all issues get the same amount of coverage (your codes won't be able to show that). Personal contacts also included short informative talks at visitor centers.

- We must have the backing of management in order to truthfully interpret resource management issues. Some of these issues are not very politically acceptable. The feeling on the part of many interpreters is that you better not talk about certain issues. Call if the Lorraine M. syndrome. We need to know management's position, that is scientifically supportable, and that we will be supported in our interpretive message.

- Emphasis on natural resource issues is seasonal, therefore interpretive efforts are also seasonal. We consider temporary exhibits as the most cost-effective media for interpreting these resources. They accommodate the public regardless of the length of stay in the park.

- Don't be afraid to interpret all natural resources. It can be done without detracting from the theme of the park!!

- The comprehensive management plan needs to be completed for the City of Rocks National Reserve. When that has been completed an interpretive prospectus is needed to set direction.

- One needs to be knowledgeable about a subject to interpret. You cannot hire a GS-4 who knows all subjects; history, geology, fossils, law enforcement policy, vegetation management, riparian issues, biology, etc. Screen-out elements for hiring interpreters focus on primary themes (in our case geology and paleontology). Down-time for study is limited, training is limited, so secondary issues will get secondary focus and treatment. Permanent specialists in each field need to learn interpretive skills and start offering personal services on a regular basis to visitors, ensuring high quality interpretation on secondary themes for special groups. Have one person in each park become proficient in grant writing. Start applying for grants to fund interpretive media on natural resources.

- In an urban setting such as we have we need to communicate with residents who live on our borders through newsletters (occasionally) and meetings to discuss park policies and operations.

- Tie interpretation to park theme and enabling legislation.

- We do as well as we can with what we are provided to do the job with--don't have support resources to reach full potential.

- I feel that interpreting all resource issues is the role of interpretation and if that is not being done, then we are not doing our job!

- At the request of the barrier island seashore superintendent, our environmental education workshop participants brainstormed the potential for barrier island videos for both in-house and public consumption. It might have some value for interpreting resources of this kind of park, and a copy of a memo I did on the subject is attached. Conceivably, videos for other parks with similar themes might work.

- Direct education programs should be offered to children through environmental education programs.

- The Natural Science Awareness outreach program is aimed at interpreting basic scientific, biological, and physical information with elementary students in the area. People lack basic/rudimentary knowledge of the scientific method and concept such as cycles, interdependence, change, etc.

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APPENDIX F

Natural Resource Information for Interpreters

The following sources are recommended to National Park Service interpreters for keeping current on natural resource issues affecting the United States and the world. These publications range broadly in subject and are not highly technical.

Reports

Highlights of Natural Resources Management, published annually. Accounts of natural resource management projects in the National Park System. Free. National Park Service, Wildlife and Vegetation Division, Washington, D.C., 202/343-3022.

Environmental Quality, published annually. Describes trends in various elements of the United States environment. Free. Council on Environmental Quality, Washington, D.C., 202/395-5750.

State of the World, published annually. Discussions on global events and conditions including the environment, economics, and social conditions. Addresses problems and provides answers. $13.95. Worldwatch Institute, 1776 Massachusetts Ave., NW, Washington, D.C., 20036, 202/452-1999.

Vital Signs, published annually. Concise presentations of the good and bad conditions that affect the health of our planet and civilization. $10.95. Worldwatch Institute, 1776 Massachusetts Ave., NW, Washington, D.C., 20036, 202/452-1999.

World Resources, published biannually. Chapters follow trends in various components of the global environment. Voluminous data. $23.95. World Resources, P.O. Box 4852, Hampden Station, Baltimore, MD, 21211, 1-800-822-0504.

Periodicals

American Forests, bimonthly. Covers many aspects of forestry and management. $30.00. American Forests, P.O. Box 2000, Washington, D.C., 20013, 1-800-873-5323.

Amicus Journal, quarterly. Covers all types of national and international environmental issues, with advocacy. $10.00. Natural Resources Defense Council, Attn: Amicus Journal, 40 W. 20th Street, New York, NY, 10011, 212/727-2700.

Audubon, bimonthly. Covers environmental issues with some wildlife emphasis. National Audubon Society, P.O. Box 52529, Boulder, CO, 80322, 1-800-274-4201.

BioScience, eleven issues per year. Articles on the biological sciences and some with conservation orientation. $49.50. BioScience, Circulation, AIBS, 730 11th Street, NW, Washington, D.C., 20001-4521.

Conservation Biology, quarterly. Addresses biological aspects of conservation issues. Journal of the Society for Conservation Biology, published by Blackwell Scientific Publications, Three Cambridge Center, Cambridge, MA, 02142, 617/225-0401.

EARTH, bimonthly. Articles covering a wide range of earth sciences in an easy-to-read format. $19.95. Kalmbach Publishing Co., P.O. Box 1612, Waukesha, WI, 53187, 1-800-533-6644.

Endangered Species Technical Bulletin, quarterly. Current status of endangered species in the United States. Free. U.S. Fish and Wildlife Service, Washington, D.C., 703/358-2171.

Forum, quarterly. Articles addressing a wide range of issues in protected areas and on public lands. $35.00. The George Wright Society, P.O. Box 65, Hancock, MI, 49930-0065.

Natural History, monthly. Articles that promote the understanding and preservation of biological and cultural diversity. $28.00. American Museum of Natural History, Central Park West at 79th Street, New York, NY, 10024.

National Parks, bimonthly. Information about national parks and discussions of issues affecting national parks. $22.00. National Parks and Conservation Association, 1776 Massachusetts Ave. NW, Washington, D.C., 20036, 202/223-6722.

Park Science, quarterly. Information about research being conducted throughout the National Park System. Free. Rick Selleck, Editor, Natural Resources Publication Office, P.O. Box 25287, Denver, CO, 80225-0287, 303-969-2147.

Resources, quarterly. Each issue tends to focus on a specific resource issue with a series of articles. Free. Resources for the Future, 1616 P Street, NW, Washington, D.C., 20036-5000, 202/328-5000.

Research and Exploration, quarterly. A wide range of articles addressing natural and cultural subjects affecting the global environment. Somewhat scholarly. $40.00. National Geographic Society, Department 1675, Washington, D.C., 20036, 202/857-7766.

Science News, weekly. Concise, timely articles on new developments in all scientific fields, written in a popular style. $39.50. Science Service, Inc., Subscription Department, P.O. Box 1925, Marion, OH, 43305, 1-800-247-2160.

Scientific American, monthly. Developments in science, sometimes related to environmental issues. $36.00. 1-800-333-1199.

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